COUNTY OF **SANTA** CRUZ

PLANNING DEPARTMENT

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ALVIN JAMES, DIRECTOR

May 28,2002

Agenda: June 11,2002

Board of Supervisors
County of Santa Cruz
701 Ocean Street
Santa Cruz, California 95060

PUBLIC HEARING TO CONSIDER EXTENDING THE DURATION OF THE INTERIM WIRELESS COMMUNICATION FACILITIES ORDINANCE

Members of the Board:

On June 26, 2001, your Board adopted an Interim Wireless Communication Facilities (WCF) Ordinance to be in effect for 45-days and, on August **8,** 2001, extended its duration to **a** full year (i.e., until June 25, 2002). The purpose of the Interim WCF Ordinance was to give Planning Department staff the necessary time to research, prepare and process a permanent WCF Ordinance.

On January 23, 2002 the Planning Commission considered a proposed draft permanent WCF Ordinance but, primarily due to concerns from representatives of the wireless communications industry, the Planning Commission directed staff to meet with the affected parties, consider their concerns, and return with a revised draft permanent WCF ordinance that better addresses those concerns. Due to this unanticipated delay in the process, the County will not be able to meet the June 25, 2002 deadline when final approval by the Coastal Commission would be required before the term of the current Interim WCF Ordinance expires. Therefore, staff is recommending that the term of the existing Interim WCF Ordinance be extended an additional twelve (12) months (i.e., until June 11, 2003) to provide the additional time necessary to revise and process the permanent WCF ordinance.

BACKGROUND

On January **9,** 2001, your Board considered three controversial applications for Personal Communication Services (PCS) towers along the North Coast stretch of Highway One. As a result of the issues raised at this hearing, your Board directed the Planning Department to report back with a work program for the development of regulations relating to wireless communication facilities.

On February **6,** 2001, your Board considered the proposed work program for preparation of the wireless communication facilities ordinance, and directed the Planning Department to return on

May 8,2001, with a conceptual interim ordinance. The Planning Department was also directed to form an advisory committee, including representatives from personal wireless communication service providers, pubic safety officials, amateur radio organizations, the public, the Friends of the North Coast and the Alliance for Resource Conservation, to review and discuss the proposed ordinance. This "Telecommunications Facility Policy Advisory Committee" (see Attachment **3** for roster) met two times, in March and April 2001, and advised Planning Department staff in the development of the early drafts of the Interim Wireless Communication Facilities (WCF) Ordinance.

On May 8, 2001, the draft Interim WCF Ordinance was initially presented for your Board's consideration. During the public hearing, several members of the public raised concern about the visual impacts of cell towers, particularly along the coast, and about the possible health and environmental impacts of the radio-frequency (RF) radiation emitted by these facilities. There was also testimony supporting an exemption for public safety-related wireless communication facilities. Numerous revisions to the draft ordinance, suggested both by members of the public and your Board, were proposed at the public hearing and discussion that followed, and several of these revisions were authorized your Board. Your Board directed staff to return on June 12,2001 with the authorized revisions incorporated into a revised draft Interim WCF Ordinance. The Telecommunication Facilities Policy Advisory Committee met for a third and final time to review the proposed changes prior to your Board's meeting on June 12,2001.

At the June 12, 2001 public hearing, your Board considered the revised draft Interim WCF Ordinance, and heard public testimony including requests for specific revisions to the draft Interim WCF Ordinance. There was additional testimony regarding visual impacts and possible health effects of RF emissions, and also some testimony requesting better cell phone coverage and supporting the proposed Sprint PCS towers on the North Coast. Your Board directed staff to make several more revisions to the draft ordinance and return again on June 26,200 1.

At the June 26,2001 public hearing, your Board heard additional testimony on possible visual and health impacts of cell towers, and also testimony in support of re-instating or broadening the public safety and amateur (HAM) radio exemptions in the ordinance. At this meeting, your Board adopted the Interim WCF Ordinance for a 45-day period, pursuant to Government Code Section *65858,* and directed County staff to prepare and process a final, permanent WCF Ordinance. The Interim WCF Ordinance is attached as Exhibit 1-A of Attachment 1.

At the August **7,** 2001 public hearing to consider extension to the Interim WCF Ordinance, your Board heard more testimony on the Interim WCF Ordinance, including additional testimony regarding possible visual and health impacts of cell towers, and also testimony in favor of prohibiting cell towers and TV/radio broadcast antennas from all residential areas. There was also some additional testimony in favor of better coverage and for the exemption of public safety communication facilities. At this meeting your Board extended the effective period of the Interim WCF Ordinance an additional IO-months and 15-days, as permitted under Government Code Section *65858,* so that the Interim WCF Ordinance would be in effect for a full year, until June 25, 2002, thus giving County staff sufficient research, preparation and processing time for the final, permanent ordinance.

Proposed Permanent WCF Ordinance Considered by the Planning Commission:

Based on research conducted since the Interim WCF Ordinance was adopted, and on Planning Department staff members' experience with several recent cell tower applications that have gone through the permitting process under the Interim WCF Ordinance, Planning staff prepared a proposed permanent WCF Ordinance that consisted of a revision and strengthening many of the provisions that were contained in the Interim WCF Ordinance. This proposed permanent WCF Ordinance was presented to the Planning Commission for their consideration on January 23, 2002. Due to concerns raised by representatives of the wireless communications industry at that meeting, the Planning Commission asked staff to reconvene the Telecommunication Policy Advisory Committee for at least one additional meeting to allow its members to consider the revisions proposed for the Interim WCF Ordinance in making it permanent.

The aspects of the Interim WCF Ordinance that were revised and strengthened included adding more rigorous application submittal and radio-frequency (RF) radiation monitoring requirements. Other changes from the Interim WCF Ordinance included the addition of numerous new definitions, for terms such as "adequate capacity", "adequate coverage" and "grade of service", that specify parameters used in at least two east coast jurisdictions to help determine if alternative sites or facility designs are technically feasible, and/or to determine if a proposed new facility is necessary for the provision of adequate wireless communication service to a given area. Proposed changes such as these and others are of a highly technical nature and would require independent analysis of project applications by a qualified, third-party RF or telecommunications engineer. It was anticipated that the County would establish a consultant list of RF/telecommunication engineering consultants, and that their services would be paid for by the applicant, similar to when a biotic report or environmental impact report is required for a project. The proposed permanent WCF Ordinance, as presented to the Planning Commission on January 23, 2002, is included in Attachment 5 to this letter.

On March 14, 2002, pursuant to Planning Commission direction, a fourth meeting of the *ad hoc* Telecommunications Policy Advisory Committee was held to allow interested parties to provide additional input on the draft permanent WCF Ordinance. Numerous concerns about the proposed changes to the Interim WCF Ordinance were expressed mostly by representatives of the wireless communications industry, but also by members of the public. Most of the industry concerns addressed requirements of the proposed permanent WCF Ordinance that would be time consuming or otherwise costly to applicants for new cellular facilities. Members of the public were primarily concerned about the radio-frequency (RF) radiation generated by these facilities and in ways to ensure that the facilities remained in compliance with FCC regulations concerning RF emissions. Numerous written comments were also received. Staff is currently in the process of considering the comments received and determining how best to address them in subsequent revisions of the draft permanent WCF ordinance.

DISCUSSION & RECOMMENDATION

Due to the unanticipated delay caused by the Planning Commission's request for additional review of the proposed permanent WCF Ordinance by interested parties, additional time will be required for the proposed permanent WCF Ordinance to be revised and then considered by the Planning Commission, your Board and the Coastal Commission. Because the term of the current Interim WCF Ordinance will expire on June 25, 2002, there will be insufficient time to revise, process and adopt the permanent WCF Ordinance before the end of the Interim WCF Ordinance's

effective period. As advised by County Counsel, we are recommending that the Interim Ordinance be extended for 12 months as specified in State law. This will allow staff to complete the processing of the permanent ordinance. When the permanent ordinance is adopted, the Interim Ordinance will be concurrently repealed.

It is, therefore, recommended that your Board:

1. Adopt the attached Ordinance extending the duration of the existing Interim WCF Ordinance by twelve (I 2) months (from June 11, 2002 until June 11, 2003) to allow sufficient time for the proposed permanent WCF Ordinance to be fully processed and to become effective; and

2. Direct Planning staff to complete the processing of the permanent ordinance within the term of the extended Interim Ordinance, including Coastal Commission review.

Sincerely,

Alvin D. Ja es
Planning Director

RECOMMENDED: _____
Susan A. Mauriello, CAO

ATTACHMENTS:

1. Ordinance Extending Duration of Interim Wireless Communication Facilities Ordinance (County Code Section 13.10.659)

2. CEQA Exemption

3. Telecommunication Facility Policy Advisory Committee Membership List

4. Minutes of January 23,2002 Planning Commission Meeting

5. Staff Report from January 23,2002 Planning Commission Meeting (on file with the Clerk of the Board)

cc: Coastal Commission
Telecommunication Policy Advisory Committee Members (see Attachment **3** for roster)

ATTACHMENT 1

ORDINANCE NO. _____

AN ORDINANCE OF THE COUNTY OF SANTA CRUZ EXTENDING THE DURATON OF COUNTY CODE SECTION 13.10.659 - INTERIM ZONING REGULATIONS REGARDING WIRELESS COMMUNICATION FACILITIES

WHEREAS, California Government Code Section 65858 enables local legislative bodies, in order to protect the public health, safety, and welfare, to adopt interim zoning regulations pending the study, or consideration of permanent zoning regulations; and

WHEREAS, the proliferation of antennas, towers, and or satellite dishes could create significant, adverse visual impacts; therefore, there is a need to regulate the siting, design, and construction of wireless communication facilities to ensure that the appearance and integrity of the community is not marred by the cluttering of unsightly facilities; and

WHEREAS, General Order 159A of the Public Utilities Commission (PUC) of the State of California acknowledges that local citizens and local government are often in a better position than the PUC to measure local impact and to identify alternative sites; and

WHEREAS, accordingly, the PUC will generally defer to local governments to regulate the location and design of cell sites, wireless communication facilities and Mobile Telephone Switching Offices (MTSOs) including (a) the issuance of land use approvals; (b) acting as Lead Agency for purposes of satisfying the California Environmental Quality Act (CEQA) and, (c) the satisfaction of noticing procedures for both land use and CEQA procedures; and

WHEREAS, while the licensing of wireless communication facilities is under the control of the Federal Communication Commission (FCC) and Public Utilities Commission (PUC) of the State of California, local government must address public health, safety, welfare, zoning, and environmental concerns where not preempted by federal statute or regulation; and

WHEREAS, a number of discretionary applications have been submitted and will be submitted for wireless communication facilities within the unincorporated areas of the County of Santa Cruz, and

WHEREAS, on June 26,2001 the Santa Cruz County Board of Supervisors adopted an Interim Wireless Communication Facilities Ordinance, Ordinance Number **463** 1, pursuant to California Government Code Section 65858, which enables local legislative bodies, in order to protect the public health, safety, and welfare, to adopt interim zoning regulations pending the study, or consideration of permanent zoning regulations; and

WHEREAS, on August **7,** 2001 the Board of Supervisors extended the duration of the Interim Wireless Communication Facilities Ordinance to a full year, ending June *25,* 2002, pending the adoption of a permanent Wireless Communication Facilities Ordinance to replace the interim ordinance; and

WHEREAS, on January 23, 2002, the Planning Commission considered a draft permanent Wireless Communication Facilities Ordinance but, due to input received from interested parties, determined that additional public review of the draft ordinance was required; and

WHEREAS, in order to accommodate the additional public review requested by the Planning Commission, additional time will be needed to process the permanent Wireless Communication Facilities Ordinance through the Planning Commission, the Board of Supervisors and Coastal Commission; and

WHEREAS, in order to protect the public health, safety and the environment during the period that a permanent wireless communications facilities ordinance is being developed, it is in the public interest for local government to extend the duration of the interim rules and regulations addressing these land uses relating to the construction, design, and siting of wireless communication facilities that were established on June 26,2001.

NOW, THERFORE, the Board of Supervisors of the County of Santa Cruz ordains that the existing interim provisions in County Code Section 13.10.659 be extended in duration for an additional twelve (12) months, to June 11,2003, as follows:

SECTION I

The Santa Cruz County Code is hereby amended by adding Section 13.10.659 to read as follows:

13.10.659 REGULATIONS FOR THE SITING, DESIGN, AND CONSTRUCTION OF WIRELESS COMMUNICATION FACILITIES

(a) PURPOSE:

The purpose of this Section is to establish regulations, standards and circumstances for the siting, design, and construction of wireless communication facilities in the unincorporated area of Santa Cruz County. It is also the purpose of this Section to assure, by the regulation of siting of wireless communications facilities, that the integrity and nature of residential, rural, commercial, and industrial areas are protected from the indiscriminateproliferation of wireless communication facilities, while complying with the Federal Telecommunication Act of 1996, General Order 159A of the Public Utilities Commission of the State of California and the policies of Santa Cruz County. It is also the purpose of this ordinance to provide clear guidance to wireless communication service providers regarding the siting of and design of wireless communication facilities.

(b) FINDINGS:

(1) The proliferation of antennas, towers, and **or** satellite dishes could create significant, adverse visual impacts; therefore, there is a need to regulate the siting, design, and construction of wireless communication facilities to ensure that the appearance and integrity of the community is not marred by the cluttering of unsightly facilities.

(2) General Order 159A of the Public Utilities Commission (PUC) of the State of California acknowledges that local citizens and local government are often in a better position than the PUC to measure local impact and to identify alternative sites. Accordingly, the PUC will generally defer to local governments to regulate the location and design of cell sites, wireless communication facilities and Mobile Telephone Switching Offices (MTSOs) including (a) the issuance of land use approvals; (b) acting as Lead Agency for purposes of satisfying the California Environmental Quality Act (CEQA) and, (c) the satisfaction of noticing procedures for both land use and CEQA procedures.

(3) While the licensing of wireless communication facilities is under the control of the Federal Communication Commission (FCC) and Public Utilities Commission (PUC) of the State of California, local government must address public health, safety, welfare, zoning, and environmental concerns where not preempted by federal statute or regulation.

(4) In order to protect the public health, safety and the environment, it is in the public interest for local government to establish rules and regulations addressing certain land use aspects relating to the construction, design, and siting of wireless communication facilities and the compatibility with surrounding land uses.

(c) APPLICABILITY:

Facilities regulated by this ordinance include the construction, modification, and placement of all Federal Communication Commission (FCC) regulated amateur radio antenna, dish antennas and any antennas used for Multi-channel, Multi-point Distribution Services (MMDS) or "Wireless Cable" and personal wireless service facilities (e.g., cellular phone services, PCS - personal communication services, wireless paging services, wireless internet services, etc.). Wireless service facilities shall be subject to the following regulations to the extent that such requirements (1) do not unreasonably discriminate among providers of functionally equivalent services or (2) do not have the effect of prohibiting personal wireless services within Santa Cruz County.

(d) DEFINITIONS:

(1) Antennas - Any system of wires, poles, rods, reflecting discs, flat panels, or similar devices used for the transmission or reception of electromagnetic waves.

(2) Cellular Service - **A** wireless telecommunications service that permits customers to use mobile telephones and other communication devices to connect, via low-power radio transmitter sites, either to the public-switched telephone network or to other fixed or mobile communication devices.

(3) CEQA- California Environmental Quality Act

(4) Co-location or Co-located Facility – When more than one wireless service providers share a single wireless communication facility, such as a telecommunications tower. A co-located facility can be comprised of a single or building that supports two or more

antennas, dishes, or similar wireless communication devices, that are separately owned or used by more than one public or private entity. Co-location can consist of additions or extensions made to existing towers so as to provide enough space for more than one user, or it can consist of a new replacement towers with more antenna space that supplants an older tower with less capacity. Placing new wireless communication facilities/antennas upon existing or new P.G.&E. or other utility towers or poles can also be considered co-location.

(5) Dish Antenna - Any device incorporating a reflective surface that is solid, open mesh, or bar configured that is shallow dish, cone, horn, or cornucopia-shaped and is used to transmit and/or receive electromagnetic signals.

(6) Equipment Building, Shelter or Cabinet - A cabinet or building used to house equipment used by wireless communication providers at a facility.

(7) FAA - Federal Aviation Administration

(8) FCC - Federal Communications Commission

(9) Ground-Mounted Wireless Communication Facility - Any antenna with its base placed directly on the ground (e.g., "popsicle stick" type), or that is attached to a mast or pipe, with an overall height of not exceeding sixteen (16) feet from the ground to the top of the antenna.

(10) Least Visually Obtrusive – with regard to wireless communication facilities, this shall refer to technically feasible facility site and/or design alternatives that render the facility the most inconspicuous relative to other technically feasible sites and/or designs. It does not mean that the facility must be completely hidden, but it may require screening or other camouflaging so that the facility is not immediately recognizable as a wireless communication facility from adjacent properties and roads used by the public.

(11) "Minor Antenna" or "Minor Wireless Communication Facility" - means any of the following:

(i) A ground- or building-mounted receive-only radio or television antenna ten (10) feet or less tall (including mast or pipe), and six **(6)** inches or less in diameter or width, and, for building mounted antennas, not exceeding the height limit for non-commercial antennas in the zoning district, which is 25 feet above the zoning district's height limit for structures;

(ii) A ground- or building-mounted citizens band radio antenna ten (10) feet or less tall (including mast or pipe), and six **(6)** inches or less in diameter or width, and, for building mounted antennas, not exceeding the height limit for non-commercial antennas in the zoning district, which is 25 feet above the zoning district's height limit for structures;

(iii) A single ground- or building-mounted whip (omni) antenna, without a reflector, less than four (4) inches in diameter whose total height, including any mast to which it is

attached, is less than twenty (20) feet and, for building mounted antennas, does not exceed the height limit for non-commercial antennas in the zoning district, which is 25 feet above the zoning district's height limit for structures;

(iv) A single ground- or building-mounted panel antenna, utilizing stealth technology, with a face area of less than four and one-half **(4½)** square feet, not exceeding the height limit for the zoning district;

(v) **A** ground- or building-mounted satellite dish not more than three (3) feet in diameter for a residential zoned parcel, and six ***(6)*** feet in diameter for a commercial or industrial zoned parcel; or

(vi) A ground-, building-, or tower-mounted antenna operated by a federally licensed amateur radio operator as part of the Amateur Radio Service, the height of which (including tower or mast) does not exceed the height limit for non-commercial antennas the zoning district, which is 25 feet above the zoning district's height limit for structures.

(12) MMDS – Multi-channel, Multi-point Distribution Services (also known as "wireless cable")

(13) MTSOs - Mobile Telephone Switching Offices

(14) Monopole - A single pole-structure, usually 18" in diameter or greater, erected on the ground to support one or more wireless communication antennas and connecting appurtenances.

(15) PCS - Personal Communications Services - Digital wireless communications technology such as portable phones, pagers, faxes and computers. Also known as Personal Communications Network (PCN).

(16) PUC - California Public Utilities Commission.

(17) Stealth Technology/Techniques – Camouflaging methods applied to wireless communication towers, antennas and/or other facilities, which render them visually inconspicuous or invisible.

(18) Structure-Mounted Wireless Communication Facility - Any immobile antenna (including panels and directional antennas) attached to a structure, such as a building façade or a water tower, or mounted upon a roof.

(19) Telecommunication Tower - A mast, pole, monopole, guyed tower, lattice tower, free-standing tower, or other structure designed and primarily used to support antennas.

(20) Visual Impact – A modification or change that is incompatible with the scale, texture, form or color of the existing natural or human-made landscape.

(21) Wireless Communication Facility – **A** facility that supports the transmission and/or receipt of electromagnetic/radio signals. Wireless communication facilities include cellular radio-telephone service facilities; personal communications service facilities (including wireless internet); specialized mobile radio service facilities and commercial paging service facilities. Components of these types of facilities can consist of the following: antennas, microwave dishes, horns, and other types of equipment for the transmission or receipt of such signals, telecommunication towers or similar structures supporting said equipment, equipment buildings, parking area, and other accessory development.

(e) EXEMPTIONS:

The following are types of wireless communications facilities that are exempt from the provisions of this Section, and may be allowed in any zoning district.

(1) **A** ground- or building-mounted citizens band or two-way radio antenna including any mast.

(2) **A** ground-, building- or tower-mounted antenna operated by a federally licensed amateur radio operator as part of the Amateur or Business Radio Service.

(3) **A** ground- or building-mounted receive-only radio or television antenna which does not exceed the height requirements of the zoning district, or television dish antenna which does not exceed three (3) feet in diameter if located on residential property within the exclusive use or control of the antenna user.

(4) **A** television dish antenna that is no more than six (6) feet in diameter and is located in any area where commercial or industrial uses are allowed by the land use designation.

(5) Mobile services providing public information coverage of news events of a temporary nature (i.e., less than two-weeks duration).

(6) Hand held devices such as cell phones, business-band mobile radios, walkie-talkies, cordless telephones, garage door openers and similar devices.

(7) Wireless communication facilities to be used solely for public safety purposes, installed and operated by authorized public safety agencies (e.g., County 911 Emergency Services, police, sheriff, and/or fire departments, etc.), that are co-located with an existing wireless communication tower or other facility, as defined under Subdivision (d) part (4). All new non-co-located public safety-related wireless communication facilities require a Level V approval (i.e., zoning administrator approval with public hearing required).

(8) Any "minor" antenna or facility described under Subdivision (d), part (11).

(f) GENERAL REQUIREMENTS:

All wireless communications facilities, except for exempt facilities described in Subdivision (e), shall comply with the following requirements:

(1) Wireless communication facilities shall comply with all applicable goals, objectives and policies of the General Plan/Local Coastal Program, area plans, zoning regulations and development standards.

(2) Wireless communication facilities shall generally be allowed on parcels in any zoning districts, with a Level V review, except for certain restrictions in the following zoning districts: Single Family Residential (R-1), Multi-Family Residential (RM), Ocean Beach Residential (RB), Residential Agriculture (RA), Rural Residential (RR), Special Use (SU; with a Residential General Plan designation) and the Combining Zone overlays for Historic Landmarks (L), Mobile Homes (MH) and Salamander Protection areas (SP). In these zoning districts, new wireless communication towers shall not be permitted, except for on some types of publicly, or quasi-publicly, owned or controlled properties, including police/fire stations and churches but not including schools, or in situations where the applicant can prove that no technically feasible alternative designs (e.g., camouflaged ground- or structure- mounted antennas), or sites outside the restricted zoning district, exist that would provide adequate coverage. Camouflaged structure-mounted or camouflaged ground-mounted antennas, or co-located, may be permitted in the zoning districts cited above, subject to Level V review, but only if adequate coverage cannot be provided from alternative sites outside these zoning districts.

(3) In order to protect scenic views of the coastline and ocean, new wireless communication towers/facilities are prohibited in areas that lie between the coastline and the first through public road parallel to the sea, with the following exceptions, subject to a Level V review:

a. New and co-located facilities where it can be proven by the applicant that there are no technically feasible and environmentally superior alternatives, and that the prohibition would effectively prevent the provision of wireless communication services to a given area.

(4) All new wireless communication facilities shall be subject to a Wireless Communication Facilities Use Permit, and also a Coastal Development Permit if in the Coastal Zone. Additionally, a building permit will be required for construction of new towers and facilities.

(5) Wireless communication facilities shall comply with all FCC rules, regulations, and standards.

(6) Wireless communication facilities shall comply with all applicable criteria from the Federal Aviation Administration (FAA) and shall comply with adopted airport safety regulations for Watsonville Municipal Airport (County Code Section 13.12).

(7) Wireless communication facilities shall be sited in the least visually obtrusive location. See Number **(8)** below regarding increased visual impacts due to co-location.

(8) Co-location shall be strongly encouraged. Co-located facilities can consist of additions or extensions to existing towers if necessary to accommodate additional users, or they can be new multi-user capacity towers that replace existing single-user capacity towers. In all cases where co-location is being considered, design alternatives that maintain the existing tower's or structure's level of visual impact shall be the preferred method. Where the visual impact of an existing tower must be increased to allow for co-location, the potential increased visual impact will be weighed against the potential visual impact of constructing a new separate tower/facility nearby.

(9) Inhabitants of the county shall be protected from the possible adverse health effects associated with exposure to high levels of NIER (non-ionizing electromagnetic radiation) by ensuring that all wireless communication facilities comply with NIER standards set by the Federal Communication Commission (FCC).

(g) APPLICATION REQUIREMENTS

All new wireless communication facilities, except for exempted facilities described under Subdivision (e), must receive a Wireless Communication Facility Use Permit, and are subject to the following application requirements:

(1) Pre-Application Meeting. Prior to formal application submission, a Wireless Communication Facilities Pre-Application Review meeting shall be held with Planning Department staff. The applicant shall be required to pay a pre-application review fee, the amount of which is to be established by Resolution of the Board of Supervisors. The pre-application review meeting will allow Planning Department staff to provide feedback to the applicant regarding facility siting and design prior to formal application submittal.

(2) Submittal Information. For all wireless communication facilities, except exempt facilities as described in Subdivision (e), the Planning Director shall establish and maintain a list of information that must accompany each application. Said information shall include, but may not be limited to:

(i) The identity and legal status of the applicant, including any affiliates.

(ii) The name, address, and telephone number of the officer, agent or employee responsible for the accuracy of the application information.

(iii) The name, address, and telephone number of the owner, and agent representing the owner, if applicable, of the property upon which the proposed wireless communication facility is to be built and title reports identifying legal access.

(iv) The address and assessor parcel number(s) of the proposed wireless communication facility site, including the precise latitude/longitude coordinates (in NAD **83)** of the proposed facility location on the site.

(v) **A** narrative and map description of applicant's existing wireless communication facilities network and proposed/anticipated future facilities (with precise latitude/longitude coordinates in NAD 83) within both the unincorporated and incorporated areas of Santa Cruz County (note: information regarding proposed network expansions will kept confidential by the County if identified in writing as trade secrets by the applicant).

(vi) **A** description of the wireless communication services that the applicant intends to offer to provide, or is currently offering or providing, to persons, firms, businesses or institutions within both the unincorporated and incorporated areas of Santa Cruz County.

(vii) Information sufficient to determine that the applicant has applied for and received any certificate of authority required by the California Public Utilities Commission (if applicable) to provide wireless communications services or facilities within the unincorporated areas of the County of Santa Cruz.

(viii) Information sufficient to determine that the applicant has applied for and received any building permit, operating license or other approvals required by the Federal Communications Commission (FCC) to provide services or facilities within the unincorporated areas of the County of Santa Cruz.

(ix) Compliance with the FCC's non-ionizing electromagnetic radiation (NIER) standards or other applicable standards shall be demonstrated for any new wireless communication facility through submission, at the time of application for the necessary permit or entitlement, of NIER calculations specifying NIER levels in the area surrounding the proposed facility. Calculations shall be made of expected NIER exposure levels during peak operation periods at a range of distances from 50 to 1,000 feet, taking into account cumulative NIER exposure levels from the proposed source in combination with all other existing NIER transmission sources within a one-mile radius. This should also include a plan to ensure that the public would be kept at a safe distance from any NIER transmission source associated with the proposed wireless communication facility, consistent with the NIER standards of the FCC, or any potential future superceding standards.

(x) A plan for security considerations (e.g., proposed fences, locks, alarms, etc.).

(xi) Facility design alternatives to the proposal, including a summary description of other potential facility types, with a short explanation as to why the proposed design/facility type was selected.

(xii) Such other information as the Planning Director may reasonably require, including additional information specific to the County's Wireless Communication Facilities Geographic Information System (GIS).

(xiii) A detailed visual simulation of the wireless communication facility shall be provided along with a written report from the installer, including a map showing all locations where an unimpaired signal can be received for that facility. Visual simulation can consist of either a physical mock-up of the facility, balloon simulation, computer simulation or other means. Photo-simulations shall be submitted of the proposed wireless communication facility, and also potential alternative facility design options, from locations from which the public would typically view the site, as appropriate. More in-depth visual analyses will be required for facilities proposed in visual resource areas, as designated in Section 5.10 of the County General Plan/LCP. The analysis shall assess the cumulative visual impacts of the proposed facility and other existing and known/anticipated future wireless communication facilities in the area, and shall identify and include all potential mitigation measures for visual impacts, consistent with the technological requirements of the proposed telecommunication service. All costs for the visual analysis, and applicable administrative costs, shall be borne by the applicant.

(xiv) An alternative sites analysis shall be submitted by the applicant, subject to the approval of the appropriate decision making authority, which identifies reasonable, technically feasible, alternative locations and/or facilities which would provide the proposed telecommunication service. The intention of the alternatives analysis is to present alternative strategies that would minimize the number, size, and adverse environmental impacts of facilities necessary to provide the needed services to the County. The analysis shall address the potential for co-location and the potential to locate facilities as close as possible to the intended service area. It shall also explain the rationale for selection of the proposed site in view of the relative merits of any of the technically feasible alternatives. The County may require independent verification of this analysis at the applicant's expense. Where a wireless communication facility exists on, or in reasonable proximity to, the proposed site location, co-location shall be strongly encouraged, particularly if it will not increase the visual impact of the existing facility. If a co-location agreement cannot be obtained, or if co-location is determined to be technically infeasible, documentation of the effort and the reasons why co-location was not possible shall be submitted and reviewed by the Planning Director.

The Planning Director may release an applicant from having to provide one or more of the pieces of information on this list upon a finding that in the specific case involved said information is not necessary to process or make a decision on the application being submitted.

(3) Amendment. Each applicant/registrant shall inform the County, within thirty **(30)** days of any change of the information required pursuant to this Subdivision.

(4) Technical Review. The applicant will be notified if an independent technical review of any submitted technical materials is required. The Planning Director, may employ, on behalf of the County, an independent technical expert to review any technical materials submitted including, but not limited to, those required under this Subdivision and in those cases where a technical demonstration of unavoidable need or unavailability of alternatives is required. The applicant shall pay all the costs of said review. If clearly marked as such by the applicant, any trade secrets or proprietary information disclosed to the County, the applicant, or the expert hired shall remain confidential and shall not be disclosed to any third party.

(5) Fees. Fees for review of all Wireless Communication Facilities Use Permits shall be established by Resolution of the Board of Supervisors.

(h) GENERAL DEVELOPMENT/PERFORMANCE STANDARDS:

(1) Site Location

Except exempt facilities as described in Subdivision (e), the following criteria shall govern appropriate locations for wireless communication facilities, including dish antennas and Multi-channel, Multi-point Distribution Services (MMDS)/wireless cable antennas, and may require an alternative site other than the site shown on an initial permit application for a wireless facility:

(i) Site location and development of wireless communications facilities shall preserve the visual character and aesthetic values of the specific parcel and surrounding land uses to the greatest extent that is technically feasible, and shall minimize impacts on public views to the ocean. Support facilities shall be integrated to the existing characteristics of the site, so as to minimize visual impact.

(ii) Co-location is strongly encouraged in any situation where it is the least visually obtrusive option, such as when increasing the height/bulk of an exiting tower would create less visual impact than constructing a new separate tower in a nearby location.

(iii) Wireless communications facilities, to every extent possible, should not be sited to create visual clutter or adverse visual impacts.

(iv) Wireless communication facilities shall be sited and designed to be as visually unobtrusive as possible. Consistent with General Plan/LCP Policy **8.6.6,** wireless communication facilities must be sited below the ridgeline, unless no other technically feasible and environmentally superior alternative exists.

(v) Disturbance of existing topography and on-site vegetation shall be minimized, unless such disturbance would substantially reduce the visual impacts of the facility.

(vi) Any exterior lighting, except as required for FAA regulations for airport safety, shall be manually operated and used only during night maintenance checks or in emergencies. The lighting shall be constructed or located so that only the intended area is illuminated and off-site glare is fully controlled.

(vii) No wireless communication facility shall be installed within the safety zone or runway protection zone of any airport, airstrip or helipad within Santa Cruz County unless the airport owner/operator indicates that it will not adversely affect the operation of the airport, airstrip or helipad.

(viii) No wireless communication facility shall be installed at a location where special painting or lighting will be required by the **FAA** regulations unless the applicant has demonstrated to the Planning Director, that the proposed location is the only technically feasible location for the provision of services as required by the FCC.

(ix) New wireless communication towers/facilities within the Coastal Zone shall not be located between the coastline and the first through public road parallel to the sea, except in the following instances, subject to a Level V review:

a. New and co-located facilities where it can be proven by the applicant that there are no technically feasible and environmentally superior alternatives, and that the prohibition would effectively prevent the provision of wireless communication services to a given area.

Additionally, new wireless communication facilities in any portion of the Coastal Zone shall be consistent with applicable policies of the County Local Coastal Program (LCP) and the California Coastal Act. No portion of a wireless facility shall extend onto or impede access to a public beach.

(x) All proposed wireless communication facilities shall comply with the policies of the County General Plan/LCP and applicable development standards for the zoning district in which the facility is to be located.

(xi) In situations where a new wireless communication facility is proposed to be sited within 1,000 feet of residential or school uses, the new tower/antenna shall be located on a portion of the site that is as far away as possible from the residential or school uses. This provision will remain in force unless it can be proven by the applicant that a proposed location closer to residential or school use is the only technically feasible alternative. This provision does not apply to facilities proposed to be co-located onto existing towers/facilities/structures.

(2) Design Review Criteria

The following criteria apply to all wireless communication facilities, except exempt facilities as described in Subdivision (e):

(i) Non-Flammable Materials. Towers and monopoles shall be constructed of non-flammable material, unless specifically approved and conditioned by the County to be otherwise (e.g., when a wooden structure is necessary to minimize visual impact).

(ii) Tower type. All ground-mounted telecommunication towers shall be self-supporting monopoles except where satisfactory evidence is submitted to the appropriate decision-making body that a guyed/lattice tower is required.

(iii) Support facilities. Any support facilities not placed underground shall be located and designed to minimize their visibility. These structures shall be no taller than twelve (12) feet in height, and shall be designed to blend with existing architecture in the area or shall be screened from sight by mature landscaping.

(iv) Paint color. All support facilities, poles, towers, antenna supports, antennas, and other components of communication facilities shall be of a color approved by the appropriate authority. If a facility is conditioned to require paint, it shall initially be painted with a flat (i.e., non-reflective) paint color approved by the appropriate authority, and thereafter repainted as necessary with a flat paint color. Components of a wireless communication facility which will be viewed against soils, trees, or grasslands, shall be of a color consistent with these landscapes.

(v) Visual impact mitigation. Special design of wireless communication facilities may be required to mitigate potentially significant adverse visual impacts, including appropriate camouflaging or utilization of stealth techniques.

(vi) Height. The height of a wireless communication tower shall be measured from the natural undisturbed ground surface below the center of the base of said tower to the top of the tower itself or, if higher, to the tip of the highest antenna or piece of equipment attached thereto. In the case of building-mounted towers the height of the tower includes the height of the portion of the building on which it is mounted. In the case of "crank-up" or other similar towers whose height can be adjusted, the height of the tower shall be the maximum height to which it is capable of being raised. While the County Zoning Ordinance does not impose height restrictions upon telecommunication towers, all towers should be designed to be the shortest height possible so as to minimize visual impact and facilitate the approval process. Any applications for towers of a height more than 25 feet above the allowed height for structures in the zoning district must include a written justification proving the need for a tower of that height and the absence of viable alternatives that would have less visual impact.

(vii) Lighting. Except for as provided for under Subdivision (h)(1)(vi), all wireless communication facilities shall be unlit except when authorized personnel are actually present at night.

(viii) Roads and Parking. All wireless communication facilities shall be served by the minimum sized roads and parking areas allowed.

(ix) Vegetation Protection and Facility Screening,

a. All telecommunications facilities shall be installed in such a manner so as to maintain and enhance existing native vegetation and shall include suitable mature landscaping, using locally native plant species appropriate for the site, to screen the facility, where necessary. For purposes of this section, "mature landscaping" shall mean trees, shrubs or other vegetation of a size that will provide the appropriate level of visual screening immediately upon installation.

b. No actions shall be taken subsequent to project completion with respect to the vegetation present that would increase the visibility of the facility itself or the access road and power/telecommunication lines serving it. The owner(s)/operator(s) of the facility shall be responsible for maintenance and replacement of all required landscaping.

(x) Fire prevention. **All** wireless communication facilities shall be designed and operated in such a manner so as to minimize the risk of igniting a fire or intensifying one that otherwise occurs. To this end, all of the following measures shall be implemented for all wireless communication facilities, when determined necessary by the Fire Chief:

a. At least one-hour fire resistant interior surfaces shall be used in the construction of all buildings;

b. Rapid entry (KNOX) systems shall be installed as required by the Fire Chief;

c. Type and location of vegetation, screening materials and other materials within ten (10) feet of the facility and all new structures, including telecommunication towers, shall have review for fire safety purposes by the Fire Chief Requirements established by the Fire Chief shall be followed; and

d. All tree trimmings and trash generated by construction of the facility shall be removed from the property and properly disposed of prior to building perrnit finalization or commencement of operation, whichever comes first.

(xi) Noise and traffic. All wireless communication facilities shall be constructed and operated in such a manner as to minimize the amount of disruption caused to nearby properties. To that end all the following measures shall be implemented for all wireless communication facilities:

a. Outdoor noise producing construction activities shall only take place on non-holiday weekdays between the hours of 8:00 a.m. and 7:00 p.m. unless allowed at other times by the approving body; and

b. Backup generators shall only be operated during power outages and for testing and maintenance purposes. If the facility is located within one hundred feet (100') of a residential dwelling unit, noise attenuation measures shall be included to reduce noise levels at the facility to a maximum exterior noise level of 60 Ldn at the property line and a maximum interior noise level of **45** Ldn within nearby residences.

(xii) Facility and site sharing (co-location). New wireless communication towers that are designed to accommodate multiple carriers, so as to facilitate future co-locations and thus minimize the need to construct additional towers, will be encouraged. New telecommunications towers should be designed and constructed to accommodate future additional antennas and/or height extensions, as technically feasible and appropriate. Other new wireless communication facility appurtenances, including but not limited to parking areas, access roads, and utilities should also be designed so as not to preclude site sharing by multiple users, as technically feasible and appropriate, thus removing potential obstacles to future co-location opportunities. However, a wireless service provider will not be required or encouraged to lease more land than is necessary for the proposed use. If room for potential future additional users cannot be accommodated on a new wireless communication tower/facility, written justification stating the reasons why shall be submitted by the applicant.

(xiii) Interference. Approval for the establishment of facilities improved with an existing microwave band or other public service use or facility, which creates interference or interference is anticipated as a result of said establishment of additional facilities, shall include provisions for the relocation of said existing public use facilities. All costs associated with said relocation shall be borne by the applicant for the additional facilities.

(i) NON-IONIZING ELECTROMAGNETIC RADIATION (NIER) MONITORING:

The following applies to all wireless communication facilities, except for exempt facilities as described in Subdivision (e):

(1) Public Health. No wireless communication facility shall be located or operated in such a manner that it poses, either by itself or in combination with other such facilities, a potential threat to public health. To that end, no telecommunication facility or combination of facilities shall produce at any time power densities in any area that exceed the FCC-adopted standard for human exposure, as amended, or any more restrictive standard subsequently adopted or promulgated by the County, the State of California, or the federal government.

(2) Initial Compliance with Non-Ionizing Electromagnetic Radiation (NIER) Standards. Initial compliance with the FCC's NIER standards shall be demonstrated for any new wireless communication facility, including co-located facilities, through submission of a report documenting initial NIER monitoring at the facility site after the commencement of normal operations. The NIER measurements shall be made, at the applicant's expense, by a qualified electrical engineer licensed by the State of California, during normal operating conditions, including typical peak-use periods. The report shall include measurement of NIER emissions generated by the facility and also other nearby emission sources, from various directions and particularly from adjacent

areas with habitable structures. Measurements shall be made of NIER exposure levels during peak operation periods at a range of distances from 50 to 1,000 feet, taking into account cumulative NIER exposure levels from the proposed source in combination with all other existing NIER transmission sources within a one-mile radius The report shall compare the measured results to the FCC NIER standards for such facilities. The report documenting these measurements and the findings with respect to compliance with the established NIER standard shall be submitted to the Planning Director no later than the first day of July following commencement of facility operation.

(3) Ongoing Monitoring of NIER Levels. Every wireless communication facility authorized under this section, shall demonstrate continued compliance with the NIER standard established by the FCC, and any NIER standards of other regulatory agencies as may become effective. By July 1st of every second year, a report listing each transmitter and antenna present at the facility and the effective radiated power radiated shall be submitted to the Planning Director. This bi-annual report shall also include measurement of NIER emissions generated by the facility and other nearby emission sources, from various directions and particularly from adjacent areas with habitable structures, during normal operating conditions (including typical peak-use periods). The operator of the facility shall hire a qualified electrical engineer licensed by the State of California to conduct the NIER measurements. The NIER measurements shall be made of NIER exposure levels during peak operation periods at a range of distances from 50 to 1,000 feet, taking into account cumulative NIER exposure levels from the proposed source in combination with all other existing NIER transmission sources within a one-mile radius. In the case of a change in the standard, the required report shall be submitted within ninety (90) days of the date said change becomes effective. If the Planning Director determines that, as a result of the initial or bi-annual monitoring reports, additional review or testing is necessary, a certified electrical engineer shall be retained at the expense of the permitee, to measure the NIER levels and prepare a report for review by the Planning Director.

(4) Failed Compliance. Failure to supply the required reports or to remain in continued compliance with the NIER standard established by the FCC, or other regulatory agency if applicable, shall be grounds for review of the use permit or other entitlement.

(j) REQUIRED LEVEL OF REVIEW:

All new wireless communication facilities, except for exempt facilities as described in Subdivision (e), require a Wireless Communication Facility Use Permit. If the proposed facility is located in the Coastal Zone, a separate Coastal Development Permit shall be required. In addition, a building permit authorizing facility construction shall be required for all wireless communication facilities, including exempt facilities described in Subdivision (e). All Wireless Communication Facilities Use Permits shall require at least a Level V approval. Table 1 below summarizes the restrictions on new wireless communication facilities:

Table 1: SUMMARY OF RESTRICTIONS AND REQUIRED LEVEL OF REVIEW FOR PROPOSED NEW WIRELESS COMMUNICATION FACILITIES

Type of Proposed Wireless Communication Facility	R-1, RM, RB, RA, RR, SU (with residential General Plan designation), MH, L, &SP Zones (see below for descriptions of zoning designations)	Areas Between the Coastline and the First Public Through Road	All Other Areas
Non-Camouflaged Structure, or Ground$_2$-Mounted	Not Permitted5	Not Permitted$_5$	Level V
Camouflaged Structure, or Ground$_2$-Mounted	Level V	Not Permitted$_5$	Level V
Telecommunication Towers$_3$	Not Permitted5	Not Permitted,	Level V
Co-Located$_4$ Facilities	Level V	Level V	Level V

NOTE: **Level V Review** = Zoning Administrator approval, with noticing of property owners within 300 feet of subject property and a public hearing required

1. Roof or façade mounted antennas (on buildings, water tanks, etc.)
2. Antennas mounted directed directly on the ground, or to a mast or pipe that extends no more than ***5*** feet from the ground (not including the antenna itself).
3. "Telecommunication Towers" include any monopole, lattice tower, and/or mast that supports one or more antenna.
4. New antennas attached to existing towers (including P.G.& E./utility towers) or to existing ground/structure mounted antennas/masts.
5. Permitted with Level V review if no technically feasible and environmentally superior alternatives are available.

Restricted Zoning Designations:

R-1: Single Family Residential
RM: Multi-Family Residential
RB: Ocean Beach Residential
RA: Residential Agriculture
RR: Rural Residential
SU: Special Use (with Residential General Plan designation)
L: Historic Landmark Combining/Overlay Zone
MH: Mobile Homes Combining/Overlay Zone
SP: Salamander Protection Combining/Overlay Zone

(1) REQUIRED FINDINGS:

In order to grant any Wireless Communications Facility Use Permit and/or any Coastal Development Permit if the facility is located in the Coastal Zone, the approving body shall make the required development permit findings (Section 18.10.230) as well as the following findings:

(1) That the development of the proposed wireless communications facility will not significantly affect any designated visual resources, or otherwise environmentally sensitive areas or resources, as defined in the Santa Cruz County General Plan/LCP (Sections 5.1, 5.10, and 8.6.6.), or there is no other environmentally superior and technically feasible alternative to the proposed location with less visual impacts and the proposed facility has been modified to minimize its visual and environmental impacts.

(2) That the site is adequate for the development of the proposed wireless communications facility and that the applicant has demonstrated that there are not environmentally superior and technically feasible alternative sites or designs for the proposed facility.

(3) That the subject property upon which the wireless communications facility is to be built is in compliance with all rules and regulations pertaining to zoning uses, subdivisions and any other applicable provisions of this Title and that all zoning violation abatement costs, if any, have been paid.

(4) That the proposed wireless communication facility will not create a hazard for aircraft in flight.

(5) That the proposed wireless communication facility is in compliance with all FCC and California PUC standards and requirements.

If the proposed facility requires a Coastal Development Permit, the Approving Body shall also make the required findings in Section 13.20.110. Any decision to deny a permit for a personal wireless service facility shall be in writing and shall be supported by substantial evidence and shall specifically identify the reasons for the decision, the evidence that led to the decision and the written record of all evidence.

(m) SITE RESTORATION UPON TERMINATION/ABANDONMENT OF FACILITY:

(1) The site shall be restored as nearly as possible to its pre-construction state within six months of termination of use or abandonment of the site.

(2) Applicant shall enter into a site restoration agreement, consistent with subsection (m)(1), subject to the approval of the Planning Director.

(n) INDEMNIFICATION:

Each permit issued pursuant to this Section shall have as a condition of the permit, a requirement that the applicant indemnify and hold harmless the county and its officers, agents, and employees from actions or claims of any description brought on account of any injury or damages sustained, by any person or property resulting from the issuance of the permit and the conduct of the activities authorized under said permit.

SECTION II

If any section, subsection, sentence, clause, or portion of this ordinance is for any reason held to be invalid by the decision of any court of competent jurisdiction, such decision shall not effect the remaining portions of this Ordinance. The Board of Supervisors of this County hereby declares that it would have adopted this Ordinance and each section, subsection, sentence, clause, phrase or portion thereof, irrespective of any such decision.

SECTION III

The Board of Supervisors hereby finds, determines, and declares that this ordinance is adopted consistent with Government Code Section 65858 and is necessary for the protection of the public health, safety and general welfare. The facts constituting the need for such a measure are set forth in the preamble of this ordinance.

In accordance with Government Code Section 65858, this ordinance shall be in force and effect for twelve (12) months from its date of adoption.

PASSED AND ADOPTED this 11th day of June 2002, by the Board of Supervisors of the County of Santa Cruz by the following vote:

AYES: SUPERVISORS
NOES: SUPERVISORS
ABSENT: SUPERVISORS
ABSTAIN: SUPERVISORS

_____
Chairman of the Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM: David Knoles
Assistant County Counsel

DISTRIBUTION: County Counsel
CAO
Planning Department
Sheriff
General Services

NOTICE OF EXEMPTION FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

Attachment 2

0426

The County of Santa Cruz has reviewed the project described below and has determined that it is exempt from the provisions of CEQA as specified in Sections 15061 - 15329 of CEQA for the reason(s) which have been checked on this document.

Application No. ***N/A***
Assessor Parcel No. ***N/A***
Project Location: ***Countywide***
Project Description: ***Extension of Duration of Interim Wireless Communication Facilities Ordinance***
Person or Agency Proposing Project: ***Santa Cruz County Planning Department***
Phone Number: ***(831) 454-3183***

A. _____ The proposed activity is not a project under CEQA Guidelines, Sections **1928** and 501.

B. _____ Ministerial Project involving only the use of fixed standards or objective measurements without personal judgement.

C. __X__ Statutory Exemption other than a Ministerial Project.
Specify type:

D. Categorical Exemption

___ 1. Existing Facility
___ 2. Replacement or Reconstruction
___ **3.** New Construction of Small Structure
4. Minor Alterations to Land
_X_ 5. Alterations in Land Use Limitations
___ **6.** Information Collection
_X_ 7. Actions by Regulatory Agencies for Protection of the Environment
_X_ 8. Actions by Regulatory Agencies for Protection of Nat. Resources
___ **9.** Inspection
10. Loans
___ 11. Accessory Structures
___ 12. Surplus Govt. Property Sales
___ 13. Acquisition of Land for Wildlife Conservation Purposes
___ 14. Minor Additions to Schools
15. Minor Land Divisions
___ 16. Transfer of Ownership of Land to Create Parks
___ 17. Open Space Contracts or Easements
___ **18.** Designation of Wilderness Areas
19. Annexation of Existing Facilities/ Lots for Exempt Facilities
___ 20. Changes in Organization of Local Agencies
___ 21. Enforcement Actions by Regulatory Agencies
___ 22. Educational Programs
23. Normal Operations of Facilities for Public Gatherings
___ 24. Regulation of Working Conditions
25. Transfers of Ownership of Interests in Land to Preserve Open Space
___ 26. Acquisition of Housing for Housing Assistance Programs
___ 27, Leasing New Facilities
___ 28. Small Hydroelectric Projects at Existing Facilities
___ **29.** Cogeneration Projects at Existing Facilities

E. _____ Lead Agency Other Than County: _____

Mark Deming

Date: June 1, 2002

Mark Deming, AICP
Project Planner

ATTACHMENT 3

SANTA CRUZ COUNTY TELECOM POLICY AVISORY COMMITTEE ROSTER

Wireless Service Providers:

Fred Viernes	Nextel
Karen Pardieck	Nextel
David Ney	Nextel
Franklin Orozco	Whalen & Co., Inc. (for Sprint PCS)
Leah Hernikl	R & G, Inc. (for Cingular)
Art Najera	General Dynamics (for Verizon & Dobson)
Susan Mason	General Dynamics (for Verizon & Dobson)
Robert Schindler	General Dynamics (for Verizon & Dobson)
John Thornton	Verizon
Robert E. Smith	Crown Castle
John Dohm	Tacit Communications (for Verizon)
Aaron Graves	American Tower Systems
Clinton McClain	Dobson/Cellular One
Marly Rey	Dobson/Cellular One
Wanda Knight	Dobson/Cellular One
Patrick Flynn	Nextsite Group (for A.T.&T. Wireless)
Randy Cobb	Lyle Company (for A.T.&T. Wireless)
Kirk Wampler	Wampler & Associates (for A.T. & T. Wireless)
Hank Tarbell	Cell Site Acquisition Services (for AT&T Wireless)
Carl Edson	Skytel

Other Agency Representatives:

Mike Ferry	City of Santa Cruz Planning Department
Ben Hathaway	Santa Cruz Consolidated Communications
Mike McDougal	Santa Cruz Co. Emergency Communications Center

ATTACHMENT 3

Other Agency Representatives (cont.):

Denise Nickerson	Santa Cruz Co. Sheriffs Office
Dan Carl/Rick Hyman	Coastal Commission

Public/Interest Group Representatives:

Celia Scott	Friends of the North Coast
Marty DeMere	Friends of the North Coast
Paul Hostetter	Friends of the North Coast
Don Croll	UCSC - Biology Dept.
Bernie Tershy	UCSC - Biology Dept.
Bill Parkin	Alliance for Resource Conservation
David Wells	Amateur Radio Rep.
Bob Wiser	Amateur Radio Rep.
Jim Maxwell	Amateur Radio Rep.
Frank Carroll	Santa Cruz Radio Club
Ron Skelton	Santa Cruz Radio Club
Richard Hanset	Amateur Radio Emergency Service
Marilynn Garrett	Interested Citizen
Karen Guggenhiem-Machlis	Interested Citizen
Karen Stern	Interested Citizen
Stephanie Preshutti	Interested Citizen
Doug Loranger	San Francisco Neighborhood Antenna-Free Union
Woody Ichiyasu	San Francisco Neighborhood Antenna-Free Union

ATTACHMENT 4

PLANNING COMMISSION MINUTES **1-23-02 (Approved)**

Proceedings of the
Santa Cruz County
Planning Commission

Volume 2002, Number **2**
January 23,2002

LOCATION: Board of Supervisors Chambers, County Government Center,
701 Ocean Street, Room 525, Santa Cruz, CA 95060

ACTION SUMMARY MINUTES

VOTING KEY
Commissioners: Osmer, Shepherd, Chair: Holbert, Bremner, Durkee
Alternate Commissioners: Hancock, Hummel, Messer, DeAlba

All original commissioners were present, except Shepherd and/or her alternate.

F. CONSENT AGENDA

F-1. Permit 99-0335
Mitigation monitoring and condition compliance progress report for PVWMA's Harkins Slough Diversion/Groundwater Recharge Project. Permit 99-0335 was approved on February 23,2000. Condition VII.B of the permit requires this progress report.
PROJECT PLANNER: KIM TSCHANTZ, 454-3170

Accept and file report as recommended.
Osmer made motion and Durkee seconded.
Voice Vote, carried 4-0, with ayes from commissioners Bremner, Durkee, Holbert, and Osmer.

F-2. 98-0603 2-2811 EAST CLIFF DR. SANTA CRUZ APN: 028-302-02
Declaration of Restriction regarding Biotic Resources to satisfy conditions IV.B.2. and 3. of approved MLD 98-0603. Document returned to planning commission for review prior to recordation.
OWNER: JAMES ROGERS
APPLICANT: IFLAND ENGINEERS, INC.
SUPERVISORIAL DIST: 1
PROJECT PLANNER: MELISSA ALLEN, 454-3181

Continued until 2/13/02 for review by County Counsel and notice to neighbors.
Bremner made motion and Durkee seconded.
Voice Vote, carried 4-0, with ayes from commissioners Bremner, Durkee, Holbert, and Osmer.

G. CONTINUED ITEMS

G-1. 99-0658 (2) 530 17TH AVE. SANTA CRUZ APN(S): 028-062-04
Proposal to create four single-family residential parcels and a remainder lot, and to relocate the existing dwelling to within the building envelope. Requires a Minor Land Division, a Coastal Development Permit, a Roadway/Roadside Exception to allow for a landscape center median on the access street in lieu of a separated planting strip and a Significant Tree Removal Permit to remove one 28-inch cedar tree. Property is located on the southeast corner of Matthew Lane at its intersection with 17th Avenue, about 200 feet north from Portola Drive, at 530-17th Avenue, Live Oak.
OWNER: DODDS ROBERT M/M SS
APPLICANT: TOM CONERLY DESIGN ASSOCIATES

SUPERVISORIAL DIST: 1
PROJECT PLANNER: CATHY GRAVES, 454-3141

Continued until 2/13/02.
Motion made by Durkee and seconded by Bremner.
Voice Vote, carried 4-0, with ayes from commissioners Bremner, Durkee, Holbert, and Osmer.

H. SCHEDULED ITEMS

H-1. Public Hearing to consider revisions to County Code Section 13.10.659, the County's Interim Wireless Communication Facilities Ordinance, a Coastal Implementing Ordinance, converting it to permanent status.
PROJECT PLANNER: FRANK BARRON, 454-2530

Continue public hearing to a future evening and re-advertise. Meet with advisory group including representatives from the industry and the public; include analysis of areas of continuation in the staff report; address issues raised in correspondence to the commission.
Motion made by Durkee and seconded by Osmer.
Voice Vote, carried 4-0, with ayes from commissioners Bremner, Durkee, Holbert, and Osmer.

H-2. 99-0561 (1) NO SITUS APN(S): 063-132-08 & 063-132-09
Appeal of the Environmental Coordinator's determination to require an Environmental Impact Report for application 99-0561, a proposal to amend Development Permit 3236-U to amend the Mining Certificate of Compliance and the Mining Reclamation Plan in order to mine to the maximum mining limit, as approved by Development Permit 3236-U. Project requires an amendment to Mining Certificate of Compliance and the Mining Reclamation Plan and a Coastal Permit, including Geologic and Geotechnical Report and Archaeologic Reviews. Project is located on the east side of Bonny Doon about 2 miles north of Highway One. **ETR** determination appealed 12/11/01.
OWNER: LONE STAR CEMENT CORP
APPLICANT: THOMAS O'DONNELL
SUPERVISORIAL DIST: 3
PROJECT PLANNER: MATTHEW BALDZTKOWSKI, 454-3189

Continued until 2113102 for additional review by county counsel.
Motion made by Holbert and seconded by Bremner.
Voice Vote, carried 4-0, with ayes from commissioners Bremner, Durkee, Holbert, and Osmer.

6-4-02

0431

Please submit this packet for
NOTE the 6-11-02 Bd. meeting/agenda item re: extension interim wireless communications ordinance

after this mornings Bd. of Supr. meeting, I spoke w/ Doug Loranger (Cloranger@california.com)

MORATORIUM's are legal while ordinances are being developed. He will send me the agreement reached voluntarily in '98 between the cellular industry and the FCC

Sausalito had a 2 yr. moritorium
Berkeley " " 1 yr. "

We call for a moritorium in Santa Cruz while a permanent ordinance is being written.

Please put this on the county website, into the Bd. packet, and provide copies to all addressed in my letter.

Marilyn Garrett
688-4603

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For Bd. web site

351 Redwood Hts. Rd.
Aptos, Ca. 95003
6/4/02

Santa Cruz City Council

To Santa Cruz City Planning Commission
Santa Cruz (To. Board of Supervisors
Cabrillo College Governing Board

Re: Call Tower environmental and health **hazards,** liability, **and** what **you** have the **LEGAL AUTHORITY** to do

For thirty years, **I was** an elementary school teacher, **for** almost twenty years of my professional career, **I** taught in this county in Pajaro Valley Unified School District. **I** took seriously my responsibility to protect the children **by** providing a "safe learning and working environment," including striving to achieve elimination of landscaping **and** agricultural pesticides known to jeopardize the immune and nervous systems **of** youngsters.

On a broader scale, you have a sacred obligation to protect the general **well** being of the larger educational institutions, neighborhoods, or communities you serve. Like a blight upon the landscape, the proliferation of cell towers cause health & environmental **hazards.** You **could** be liable, as you have this scientific literature herein submitted to you, for permitting known endangerment and failing to act upon the precautionary principle, **I** urge **you** to thoroughly study this material. Selected articles comprise those most compelling, concise, and clear. Specifically,

(1) Santa Cruz writer published in the 5/10/02 Green Press pages of the Comic **News; "Cell** phones, towers cause health, environmental hazards," by Karen Stern

(2) Material submitted by SNAFU (San **Francisco** Neighborhood Antenna Free Union) when several members attended the 3/14/02 S.C. Co. Telecom Policy Advisory Committee meeting, **SNAFU** cited what you have the LEGAL AUTHORITY to do. SNAFU **made** specific proposals **to** strengthen and improve the County's draft ordinance, which profoundly affects all in the county whom those addressed in this letter represent. **As** you will read, these proposals are based on citations and exerpts from Federal Appeals Court Case **law.** To date, none of SNAFU's **legal** recommendations have been adopted.

I'll comment here on The **June** 11th agenda item to continue the county's interim ordinance **for** another year. Caving into the pressure of the telecommunications corporations, not the pleas of the public **for** protection of health, the Planning Director unfortunately has made this continuance recommendation. **If** approved, this almost routine approval of countless cell tower permits will continue **for** another year. It seems to me **it would!** be a dereliction of your obligations to protect the public. **As** you legally can be more protective, **isn't it** imperative that you **do** so? To not act on the precautionary principle basically says "May the public **be damned."** **Yes,** take the time to study the attachments. HAVE A **MORATORIUM** ON ISSUING **ANY MORE** CELL TOWER PERMITS **DURING THIS TIME SO** NEITHER **YOU NOR YOUR** CONSTITUENTS **ARE PUT AT RISK,** I hope you receive public pressure to act in the public interest.

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(3) Dr. Neil Cherry, New Zealand scientist, who evaluated over 40 peer reviewed cell phone radiation studies. Provided here are the abstract and conclusion pages and the website.

(4) Serious potential liability issues letter submitted 8/14/01 to the County-planning commission. Today, its relevance remains, so it is included for all of you,

(5) A "Clear Call America Unplugged - a Guide to the Wireless Issue" by B. Blake Levitt, Major studies are summarized, the inadequacy of FCC standards revealed, and a section on "What to do now." You may order B.Blake Levitt's Cell Towers: Mireless Convenience? or Environmental Hazard?* (413-229-7935)(2001)

These are the proceedings of the "Cell Towers Forum" State of the Science/State of the Law (12/2/00).

*Resubmission of pages 30-49 to the Board from Blake Levitts book (From 11-26-01)

(6) EMR Resource Guide

I see the question underlying this issue: Do we have a democracy or a corptocracy? It doesn't feel like much democracy remains except with you at the local jurisdiction. We need to be asserting our democracy i.e. we the people making decisions that determine a healthy quality of life. Can we have democracy when the power of their toxic profits pollute not only our earth, ourselves, and all species, but our democratic political process as well? You are those who can courageously speak for "we the people", all of use, the students, citizens, community members, and most especially the children.

Two quotes illuminate why we face such threats& who benefits.

> "The twentieth century has been characterized by three developments of great political importance: the growth of democracy, the growth of corporate power, and the growth of corporate propaganda as a means of protecting corporate power against democracy."
>
> Alex Carey Taking the Risk our of Democracy

One of the top corporate propaganda firms, Burson-Marsteller, which includes telecommunications corporations among their clients claims, "The role of communications is to manage perceptions which motivate behaviors that create business results. . "

You. should not permit our health to be damaged for their business results.

Thank you,

Marilyn Garrett
member Toxics Action Coalition
Monterey Bay
688-4603

Comic News 5/10/02

Cell phones, towers cause health, environmental hazards

by Karen Stem

If you've noticed a mysterious purple phantom scurrying across Front Street in a hooded cape, you may have wondered what she's up to. Take your pick:

1. She's a Druid rushing to a Stonehenge ritual 2. She's a Sorcerer's Apprentice late for work 3. She's Super Girl fleeing Kryptonite 4. She's an electro-sensitive Earth woman in a radiation-proof cap: dashing through a harmful microwave field. Apparently the average American finds it easier to believe 1, 2, and 3 than 4, —which is why we're in dire straits.

Cell phones are perhaps the fastest growing adult toy on the market today with 2,500% more users since 1996 and another huge increase since 9/11. Some think we need them for safety and others think they're a nuisance. However, few are aware of the ominous dangers that are deliberately being hidden from us.

Cell phones operate on radio frequency radiation in the **UHF** (ultra high frequency) bands, where human brain tissue is known to reach peak absorption. They broadcast in the 870 Megahertz range, very close to the frequencies of microwave ovens. A plume of radiation emanates from the antenna every time the phone is used—slow-cooking the user's brain and harming others nearby. Furthermore, cell phones depend on a network of antennas (now sprouting on churches, schools, hospitals, and other public buildings) and towers, marring natural landscapes everywhere. These all beam radiation at **us 24** hours a day.

Studies have already shown cancer clusters around TV, radio and radar towers. Now we're increasing the general background radiation exponentially while adding more unfriendly frequencies. Nationwide, the number of registered towers jumped from 1,000 in 1970 to 77,700 in 2000, *with 100,000 more planned in the next few years*. This doesn't include hundreds of thousands of unregistered antennas. To quote B. Blake Levitt, editor of *Cell Towers: Wireless Convenience* or *Environmental Hazard*, "The build-out of the wireless infrastructure is creating a seamless blanket of microwave exposures for the first time in our evolutionary history in close proximity to the population ...long-term exposures are thought to be cumulative. We are, in effect, engaging in a massive biological experiment. With cell phones," she continues, "one could argue that these exposure; are somewhat voluntary. But with cell towers, these are involuntary exposures forced on people by the government."

All wireless devices depend on wireless infrastructure, including pagers, police radio, 911, and wireless Internet. Most tower output fluctuates with user volume. This means that every time you use a cell phone, you increase the radiation coming from the towers. However, the most toxic towers are the constant, non-fluctuating pager towers because they work by "blanket saturation."

There are two of them on the Palomar Hotel roof-op, making downtown Santa Cruz one of the hottest downtowns anywhere. Studies have shown DNA damage occurring in human cells at RFR levels far below the FCC limit for public exposure. Also documented is cellular **loss** of melatonin, serotonin and calcium. This leads to insomnia, depression, increase in permeability of the blood-brain barrier, increased incidence of fatigue, headache, memory loss, heart palpitation, nausea—and in extreme cases, stroke, heart attack and leukemia.

Animals are also affected. Researchers repeatedly bred mice in several locations around a cell tower. Their offspring were progressively smaller and were sterile. Also observed was decreased milk production and calving problems in cows, disorientation and death of migrating songbirds and adverse effects on frogs and salamanders. Even the vegetation near towers suffer.

The research available today on the effects of RFR exposure has led most other countries to tighten their public exposure standards (i.e., the amount of radiation a tower may put out) to levels 50 *to 1000 times stricter than ours*. Compare our 580 microwatts per square centimeter to Russia's and Italy's 10, Switzerland's 4, and China's 6. The only country with a standard more outrageous than ours is Great Britain at 5800.

So what's our problem? Dollars and cents—or dollars and no sense. The U.S. government sold out our right to control our health when it passed the Telecommunications Act of 1996, which slid through Congress greased by $29 million in lobbying expenditures by the wireless industry This Act forbids local governments to consider health concerns in making tower-siting decisions. On top of that, the industry got itself declared an emergency response "public utility," entitling them to the same liability protection as wired carriers, even though the known health risks of wireless technology are much greater.

Illness, outrage, protests and lawsuits are already happening worldwide. Recently, a Spanish court set a new precedent when it ordered a cell tower removed because of adverse effects on the health of a child with ADHD in a residence ten feet away. In Golden, Colorado, 2,000 residents signed a petition demanding a moratorium on tower sitings on nearby Lookout Mountain, which already holds over a thousand!

A bill, introduced by Senators Leahy and Jeffords of Vermont, would give power of refusal back to the states, but it has failed to gain any support in Congress. "Dynasty" star Linda Evans hit the road to spread the word after she tried unsuccessfully to prevent a supertower from being sited less than a half mile from her home. "We couldn't stop it..I have a lawyer, I have resources. I can just imagine what the average American is going to come up against when they try to stop this..."

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In Santa Cruz, protest has been mounted against the proposed addition of two new supertowers to the existing one at DeLaveaga Stroke Center (remember, cell phone radiation weakens the blood-brain barrier!). This application is still pending, as are several more including one for a tower at 7th Avenue and Eaton. The County is now developing a new ordinance on siting regulations, which should take effect next September. County Planner Frank Barron is aware of the health issues and has worked hard to draft a strong ordinance. More public hearings will be held in the coming months and public input is sorely needed. Please call Wireless Free Santa Cruz at **458-4505** for more information.

There is no definitive map or even a tally of all wireless facilities in Santa Cruz County, but for those concerned, here is a fairly good list. The higher powered facilities are near the top: Palomar Hotel, Highway One South between Bay/Porter and Park Ave. exits, DeLaveaga Stroke Center, Dominican Hospital, Cabrillo College, County Building, Civic Auditorium and Fire Station, Horsnyder Pharmacy on Soquel Ave., the Park Place Building at 7th and East Cliff—and the fake tree near the entrance to Highway One North in Aptos.

More tiot **spots**

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If you wish to practice avoidance, your **best** course is to purchase a MicroAlert, available from LessEMF (1-888-lessemf) for about $85. Or you can call Wireless Free Santa Cruz at 458-4505 for microwave **testing** of your home or workplace.

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Comic News 5/10/02

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by Karen Stern

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Santa Cruz Draft Wireless Communication Facilities Ordinance
Recommendations Submitted to the Santa Cruz County Telecom Policy Advisory Committee
by Doug Loranger, San Francisco Neighborhood Antenna-Free Union (SNAFU)
March 14, 2002

The following recommendations are based upon Santa Cruz County's legal authority to:

(1) Minimize the number of wireless antenna facilities required to provide wireless communication services in the County.

(2) Require proof of necessity by wireless carriers prior to approving any proposed wireless antenna facility.

(3) Protect public health, safety and welfare by requiring radiofrequency (RF) emissions testing protocols that inform and notify the public to the fullest extent reasonably possible of the ambient RF radiation conditions in Santa Cruz County. These protocols should also test for any actual or potential interference with public safety and other wireless frequencies in Santa Cruz County.

(4) Minimize negative impacts, including attractive nuisance.

The authority for (1) derives from the Federal Appeals Court decision *Sprint Spectrum L.P. v. Willoth,* 176F.3d 360 (2nd Cir. 1999), which states, "A local government may also reject **an** application that seeks permission to construct more towers than the minimum required to provide wireless telephone services in a given area. A denial of such a request is not a prohibition of personal wireless services as long as fewer towers would provide users in the given area with some ability to reach a cell site." (See Exhibit A.)

The authority for (2) and (4) rests in standard land use and zoning law.

The authority for (3) follows from Section 704 of the Telecommunications Act of 1996, which denies local governments the authority to "regulate the *placement, construction and modification* [emphasis added] of personal wireless services facilities on the basis of the environmental effects of RF emissions to the extent that such facilities comply with the [Federal Communications] Commission's regulations concerning such emissions," but is silent on the question of public notification. The public has a right to know, to the fullest extent reasonably possible, the cumulative environmental effects of wireless facilities in their community. This is of particular importance when a federal preemption over local decision-making related to a health and environmental issue of some concern may leave members of the public with little recourse to protect their own health and safety but an individual decision to relocate based upon available information about ambient RF levels where they live, work, attend school, etc. Santa Cruz County has a responsibility to members of the public to provide this information in a form as complete, objective, and scientifically rigorous as possible.

County-supervised testing for interference with public safety and other frequencies is both legal and reasonable in light of the FCC's inadequate staffing to conduct such testing in the field. Should interference, or the potential for interference, be detected, any such information may then be submitted to the FCC for appropriate regulatory action. (See Exhibit B.)

With these four principles in mind, the current draft of the ordinance should be strengthened and improved in the following ways.

1. **Carriers Should Be Required to Identify Their Wireless Networks in the Region in Their Entirety and in as Much Detail as Possible.** All Base Transceiver Stations, Base Station Controllers, Mobile Telephone Switching Offices, and Transit Switching Centers should be identified. All of the actual equipment -- not simply antennas or radomes -- to be utilized by an individual wireless facility should be listed by manufacturer, model number and type, catalogue number, power output, etc. This information should be provided so that any expert the County brings in to determine a carrier's claim(s) of necessity has as much information at his/her disposal as possible to evaluate such claim(s).

2. **Before Granting a Permit for a Wireless Facility in a Zoning District Where Such Facilities Are Otherwise Prohibited, a Carrier Should Be Required to Demonstrate That No Other Carrier Currently Provides Service in the Proposed Service Area.** In 13.10.659(f)(2) and (3), there are two slightly different -- but actually quite significant -- requirements governing exceptions to prohibitions of wireless facilities in certain zoning districts, one limited to the provider's own network 13.10.659(f)(2), and one more broadly construed 13.10.659(f)(3). Federal Appeals Court rulings argue in favor of making the definition in 13.10.659(f)(3) the same as in 13.10559(f)(2). In the case *APT Pittsburgh Partnership v. Penn Township,* 196 F.3d 469 (3rd Cir. 1999), the Court ruled that ". . . an unsuccessful provider applicant must show . . . that its facility will fill an existing significant gap in the ability of remote users to access the national telephone network. . . . Not all gaps in a particular provider's service will involve a gap in the service available to remote users. The provider's showing on this issue will thus have to include evidence that *the area the newfacility will serve is not already sewed by another provider."* (Emphasis added.)

3. **A Setback of at Least 1,500 Ft. from the Perimeter of Any School Should Be Required.** Cellular towers provide an 'attractive nuisance' in that they afford children a temptation to climb such structures. Under California law, the principle of 'attractive nuisance' has been superceded by the more broadly construed principle of 'foreseeability'; i.e., if it is foreseeable that under some circumstances children might attempt climb a cellular tower located in proximity to their school, Santa Cruz County has the authority to render this possibility less likely.

4. **Inter-Carrier Service Agreements Should Be Required to Assist in Minimizing the Number of Wireless Facilities Necessary to Provide Communication Services in the County.** Carriers sharing frequency ranges and common network access technologies are capable, via network service identifiers (SIDs) or Preferred Roam Lists (PRLs), of sharing available infrastructure for services provided to their wireless customers.

Proposed Changes to Draft Ordinance

13.10.659 (d): "Definitions" section should contain a definition for "BSC - Base Station Controller" and "TSC - Transit Switching Center," two crucial components of wireless networks.

13.10.659 (f)(2): Replace ". . .that adequate coverage is not already provided to proposed service area by existing wireless communications facilities in the service provider's network" with ". . .that adequate coverage is not already provided to proposed service area by existing wireless communications facilities."

13.10.659 **(f):** Add a section prohibiting the placement of wireless facilities within 1,500 ft. of the perimeter of any school based upon the land use principle of attractive nuisance and/or foreseeability.

13.10.659 (f)(7): Add a section requiring inter-carrier service agreements prior to consideration of co-location.

13.10.659 (g)(2)(v): "Evidence of Need" section: The "description of existing network" requirement should be spelled out in greater detail (i.e., carriers should be required to identify any and all Base Station Controllers, Mobile Telephone Switching Offices, Transit Switching Centers, etc.) Also, equipment should be required to be identified by actual manufacturer, model number and type, catalogue number, etc.

13.10.659 (g)(2)(xvi)(d): "Proposed Equipment Plan" should require all equipment, not simply antennas and radomes, to be identified (by manufacturer, model number and type, power output, etc.)

Cellular Wireless Antennas: Federal Appeals Court Case Law
Citations and Excerpts

Sprint Spectrum L.P. v. Willoth
176 F.3d 360 (2nd Cir. 1999)

> "We do not read the [Telecommunications Act of 1996] to allow the goals of increased competition and rapid deployment of new technology to trump all other important considerations, including the preservation of the autonomy of states and municipalities."
>
> **"A** local government may also reject an application that seeks permission to construct more towers than the minimum required to provide wireless telephone services in a given area. A denial of such a request is not a prohibition of personal wireless services as long as fewer towers would provide users in the given area with some ability to reach **a** cell site."
>
> "Furthermore, once an area is sufficiently serviced by a wireless service provider, the right to deny applications becomes broader."
>
> "We hold only that the Act's ban on prohibiting personal wireless services precludes denying an application for a facility that is the least intrusive means for closing a significant gap in a remote user's ability to reach a cell site that provides access to land-lines."

APT Pittsburgh Partnership v. Penn Township
196 F.3d 469 (3rd Cir. 1999)

> ". . .[A]n unsuccessful provider applicant must show . . . that its facility will fill an existing significant gap in the ability of remote users to access the national telephone network. . . . Not all gaps in a particular provider's service will involve a gap in the service available to remote users. The provider's showing on this issue will thus have to include evidence that the area the new facility will serve is not already served by another provider."

AT&T Wireless PCS v. Citv Council of Citv of Virvinia Beach
155 F.3d 431 (4" Cir. 1998)

> "The [Telecommunications] Act explicitly contemplates that some discrimination 'among providers of functionally equivalent services' is allowed. Any discrimination need only be reasonable."
>
> "It is not only proper but even expected that a legislature and its members will consider the views of their constituents to be particularly compelling forms of evidence, in zoning as in all other legislative matters. These views, if widely shared, will often trump those of bureaucrats or experts in the minds of reasonable legislators."

Cellular Telephone Co. v. Zoning Board of Borough of Ho-Ho-Kus
197 F.3d 64 (3rd Cir. 1999)

> Local governments can consider "quality of existing wireless service" in rejecting an application

The Sunday Oregonian 0442

AUGUST 5, 2001 2001 PULITZER PRIZE WINNER FOR PUBLIC SERVICE ★★★SUNRISE EDITION PORTLAND, OREGON

More Wiederhorn loans face scrutiny

Lawyers for union trust funds look into a possible link between Capital Consultants and money an accountant received

By JEFF MANNING and JAMES LONG
THE OREGONIAN

In 1993, Portland financier Andrew Wiederhorn made a series of personal loans totaling at least $630,000 to his former accountant — some of it while the accountant served time in federal prison for bank and securities fraud.

Wiederhorn listed the loans in a detailed personal financial statement he submitted to creditors in 1999 to prepare for the bankruptcy reorganization of his flagship company, Wilshire Financial Services Group.

The statement shows that Wiederhorn continued to make substantial personal loans to Sam Lance White even as Wilshire Credit Corp., a vital cog in his Wilshire operations, desperately borrowed millions from Capital Consultants, the Portland investment management firm, in an effort to stay afloat. It's impossible to say whether the money Wiederhorn lent White came from Capital Consultants via Wilshire Credit, but lawyers for union trust funds that lost millions when Capital Consultants collapsed are investigating the money manager's possible role in the loans.

White served as Wilshire's outside accountant from 1987 to 1996. He continued to work for Wilshire after he was forced to resign from his accounting firm, Deloitte & Touche. Wiederhorn said in a 1999 deposition related to the Wilshire restructuring that he didn't recall his exact arrangement with the ousted accountant.

"He may have been a consultant to Wilshire," Wiederhorn said. "I don't know if he was ever employed at Wilshire."

Whatever the arrangement was, former Wilshire employees recalled seeing White regularly in the offices of Wilshire Credit Corp. in Portland.

It isn't clear whether White ever repaid the money.

The trust fund lawyers lately have been circulating a memo among themselves discussing how Wiederhorn's loans to White might fit into their efforts to recover money for their clients, according to two of the attorneys in-

Please see WIEDERHORN, Page A19

Emergency calls get crowded out

Interference from cell phone towers is putting the lives of police and firefighters at risk as public safety authorities find their radio transmissions blocked

By EMILY TSAO and RYAN FRANK
THE OREGONIAN

An invisible threat endangers the lives of police officers: Across the country, officers grab for a radio only to find their voices blocked by a nearby cellular phone tower emitting more powerful transmissions.

In a six-month investigation, The Oregonian found that in at least 28 states, public safety agencies reported at least one instance of cell phone tower interference with their radios or in-car computers.

No officers have been hurt or killed as a result of the impediment. But agencies across the country say the interference often threatens public safety — and the lives of police officers and firefighters.

Among the incidents:

◆ In June, two Denver police officers on a narcotics surveillance witnessed a shooting and tried to call for emergency backup. Their radios wouldn't work until they ran a block. Radios failed again in the same location two weeks later during a foot chase.

◆ In April, two Portland officers lost radio connection as they rushed to a reported burglary near the airport.

◆ In November 2000, 12 officers in Scottsdale, Ariz., stood within 100 feet of one another but couldn't use their radios as they searched for a man who had reportedly waved a gun during a barroom brawl.

◆ In June 2000, a Tigard police officer faced an armed man and radioed for backup. Only the word "gun" went through.

"The worst-case scenario is an officer gets killed," said Detective Aaron Minor of the Scottsdale, Ariz., Police Department, which estimates that signals from a nearby cell phone tower interfered with police radios at least 300 times during a seven-month period last year.

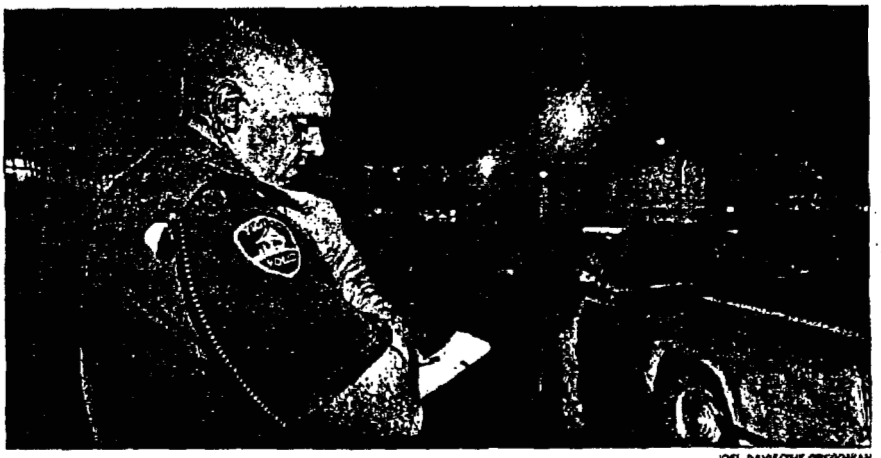
"Obviously, this could involve the loss of life," said Gloria Tristani, a commissioner with the Federal Communications Commission.

In interviews, public safety managers and FCC officials say that one cell phone company alone — Nextel Communications of Reston, Va. — is the source of interference with public safety communications in 21 states.

Unlike other cell phone companies, Nextel uses radio frequencies intertwined with or adjacent to those used by public safety radios.

Nextel agrees the interference is serious but says it occurs in only a handful of the hundreds of cities where it operates. "This isn't a widespread national problem," said Nextel Vice President Lawrence Krevor, who acknowledges that the towers the company uses cause interference in 12 states.

Please see TOWERS, Page A16

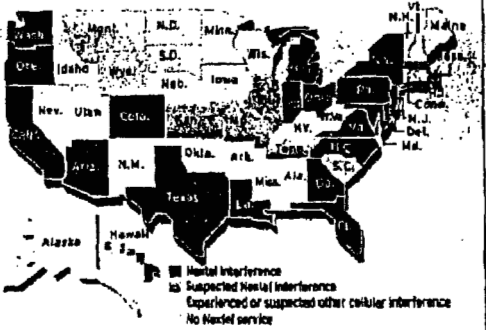


JOEL DAVIS/THE OREGONIAN

Tigard police officer Jeff Lain usually patrols alone. His radio lets others know his location and is what he uses when he calls for help. One morning last June, his radio didn't work when he approached an armed driver. Technicians later figured out signals from a nearby Nextel cell tower had interfered with his call for backup.

CELL TOWER INTERFERENCE

Over a six-month period, The Oregonian contacted public safety officials in 50 states and found 28 states with at least one case of confirmed or suspected cell phone tower interference. The public safety agencies said Nextel caused the majority of those cases.



MICHAEL MODE/THE OREGONIAN

Unseen side of politics in wallets of lobbyists

Reports offer a peek at how legislators are courted with everything from meals to Blazers tickets to rides in a BMW

By DAVE HOGAN
THE OREGONIAN

Away from the halls and hearing rooms of the state Capitol, lobbyists made sure the legislative session wasn't all work and no play for Oregon lawmakers this year.

They treated them to rounds of golf, took them to comedy shows and hosted them at Portland Trail Blazers games.

They gave them pens anchored in magnetic holders, and they gave them awards. One group of lobbyists presented House Speaker Mark Simmons with an oak table cut in the shape of Oregon.

But more than anything else, lobbyists wined and dined legislators, with the tab sometimes running into hundreds of dollars per meal, according to lobbyist expenditure reports that had to be mailed to state officials by last week.

The reports give a glimpse of a side of Oregon politics the public doesn't see, where lobbyists nurture friendships with legislators over fine meals and other tokens of appreciation. It's an old story, but one that never seems to go out of style.

John DiLorenzo, a high-powered Republican lobbyist, reported taking four House members to pricey dinners during the first half of this year, spending more than $130 on each of his guests. He and other lobbyists say those occasions help them build and maintain relationships with the lawmakers, not to buy their votes.

"I don't expect someone to vote for me because I bought them a glass of

Please see LOBBYISTS, Page A20

Towers: The FCC set the stage for problem

Continued from Page One

Nextel estimates a nationwide fix could cost millions of dollars. Public safety officials say it could be billions. But neither they, Nextel nor the FCC can agree on who should pay.

Krevor said Nextel is committed to stopping the interference on a case-by-case basis. But those fixes often only reduce interference, not stop it.

The Federal Communications Commission, which regulates the airwaves, admits it unwittingly set the stage for this problem three decades ago when it doled out the frequencies that now conflict. But Kathleen Ham, deputy chief of the FCC's Wireless Telecommunications Bureau, said the commission is not responsible for fixing it because no one is breaking the law.

Police and fire chiefs could reduce interference with new equipment, but officials say they can't afford to replace outdated radios.

Today — more than two years after a Washington County radio technician first alerted the FCC that Nextel towers were garbling firefighters' communications near Tigard — state, federal and company officials are meeting in Salt Lake City to try to determine the extent of the problem nationwide and lay out a program to fix it.

The wireless industry projects that its customer base will grow by more than 40 percent over the next two years, to 168 million. As a result, a wide range of industry experts say cell phone tower interference will get worse.

Frequencies allocated

All radio transmissions — from television signals to satellite communications to AM/FM radio — are sent through the air in waves of varying lengths. All these waves are transmitted through a spectrum that ranges from about 9 kilohertz for submarine communications to 300 gigahertz for scientific satellites. The FCC regulates all transmissions in the United States, allocating users from one end of the spectrum to the other.

In the 1970s, long before cellular phones became popular, police officers fought for extra space in the spectrum, particularly in urban areas where the airwaves were used heavily. Their allocations stuck them in the lower frequencies with little or no space to add radios for new users.

From 1974 to 1986, the FCC made available a section of the 800 megahertz band for police and fire departments and taxi and tow truck companies, among others.

The best use of the airwaves, the FCC decided, was to intertwine the users in 250 channels. The result was like 250 lanes on a highway, with police officers driving on lanes in between taxis and tow trucks. A separate allocation — a block of 800 MHz channels that are not intertwined — actually placed police between what would become two cellular companies.

The areas in which cellular carriers abut public safety transmissions would become "hot spots" for complex midair conflicts.

Nextel's birth

In 1987, a former FCC lawyer named Morgan O'Brien launched Nextel's precursor company, a mobile radio firm, with a dream of turning it into a nationwide wireless phone provider.

Starting out as a two-way radio company, O'Brien bought thousands of 800 MHz radio frequencies from small taxi and tow truck companies, among others.

The neighbors coexisted peacefully for years. Then, in 1991, the FCC made what would turn out to be a crucial decision. The federal agency allowed O'Brien's company to use the frequencies for a new purpose: to build a digital network for wireless phones.

The decision gave O'Brien's company an advantage because the radio licenses he bought were far cheaper than the ones that had been allocated to the cell phone companies that were his competitors.

These 800 MHz radio frequencies, however, were the very ones that abutted police officers and firefighters in the radio spectrum. The FCC, not realizing its decision would later affect police officers, hailed the company for using the radio spectrum more efficiently.

The company O'Brien founded later became Nextel and has flourished into the nation's fifth-largest wireless provider, with 7.7 million U.S. subscribers.

The discovery

In the spring of 1998, firefighters at one of Washington County's busiest fire stations noticed a mysterious phenomenon.

The alarm system at Tualatin Valley Fire & Rescue's station near the Washington Square mall stopped working properly, sometimes delaying firefighters' response to emergency calls in the district that covers 10 cities. Crucial radio information was sometimes garbled. Firefighters at the station complained to their 9-1-1 managers.

Spurred by the complaints, Joe Kuran, Washington County's lead radio technician, launched an investigation.

Kuran knows that radios are not perfect. Police radios, like AM/FM radios, sometimes experience poor transmission inside buildings or tunnels. Sometimes police radios don't work because of equipment failure, weather or nearby hills.

When Kuran and his staff checked the fire district's radio equipment, everything seemed to function properly. But when technicians tested the radio signals, they found something mysterious. Some areas had normal signals, and other spots just a few feet away had no signal at all.

Adding to the mystery was the discovery that radio transmissions were clearer inside the station with the garage door closed and when the station's antenna was moved inside.

Kuran said the staff looked harder.

About a quarter-mile away, they found the problem pierced on top of a red-brick building: a Nextel antenna.

When Nextel shut off its site, the interference vanished.

Nextel was transmitting at frequencies similar to those used by the fire station. Because the cell phone tower was so close to the station, its signals overpowered fire dispatch transmissions coming from a county communications tower more than four miles away atop Council Crest.

The discovery made Washington County one of the country's first agencies to prove cell tower interference.

A crusade begins

An unassuming 54-year-old with wire-rimmed glasses, Kuran doesn't have a fancy college engineering degree. He tinkered with ham radios while in high school in Wisconsin and worked in U.S. Air Force communications. He spent part of his 30-year career as a Motorola radio technician.

In November 1998, armed with his discovery, Kuran started his crusade against cell phone tower interference. He wrote what would be the first in a series of letters to FCC officials, notifying them of the problem that he said could potentially lead to the loss of life and property.

Kuran also wrote an article that appeared in the March 1999 issue of the trade journal Mobile Radio Technology, which is read by industry executives and communication engineers. His article prompted public safety officers around the country to scrutinize their own systems and wonder if cell towers were creating problems.

"Joe Kuran was the first to really nail it down," said Kevin Kearns, telecommunications manager for King County, which includes Seattle. "He was the one who put some technical meat behind it."

But much like in Washington County, other radio technicians had trouble confirming the sources of interference.

Cell phone frequencies are moved from tower to tower based on demand. Companies may use a handful of frequencies at one tower overnight but move them to another tower for rush-hour demand.

Some police radios constantly change channels, automatically seeking an open frequency each time officers push the talk button. Standing near a cell tower during a commuter rush, an officer's radio may be blocked and an hour later, just fine.

As other agencies homed in on the problem, Kuran waited to hear from the FCC.

On January 19, 2000 — 13 months after Kuran wrote his letter — the FCC wrote back.

D'wana R. Terry, the FCC's chief of public safety and private wireless division, wrote a four-paragraph letter that said neither Nextel nor Washington County violated federal guidelines. She said the parties should resolve the issue on their own.

Call for help

Six months later, interference was still cropping up in Washington County — this time near the Tigard police station and across the street from a fire station. This incident alerted county officials that the problem was growing.

When police officers enter an unknown situation, they say, their radios are one of the most important tools. They enable officers to call for help for themselves and for others. In Tigard, the radio particularly is important because officers drive the streets alone.

"The radio — it is your lifeline," said Tigard officer Jeff Lain. "It is the only way you can get help and to let people know what is going on around you. When you are on your own it is scary."

Just before 6 a.m. June 9, 2000, Lain spotted a 1984 gray Buick sedan that he said ran a stop sign. Although it looked as if he would be making a routine traffic stop, Lain said he also knew it could turn deadly.

His car's red and blue lights flashed in the early morning light.

The driver and Lain stopped at a storage facility on Southwest Burnham Street, near the police station. Across the street, Anthony Passadore, also of the Tigard police, sat in his patrol car writing reports. A Nextel cell tower stood nearby.

Lain radioed his location to the dispatch center but dispatchers couldn't hear him. He later learned that the only words that made it through were "traffic" and "Burnham."

Passadore said he saw Lain and heard static on his radio. Passadore said he moved his patrol car to get a better view of Lain but did not want to intrude.

When Lain approached the car, he noticed the driver's jacket hid a handgun, according to a police report. Lain said he called for back-up but again almost all of the transmission was blocked.

Passadore said he again heard only static and did not hear Lain's request for help. A third officer, R.J. Newman, said he heard only the word "gun."

With no backup, Lain asked the man to get out of the car. Lain removed a loaded 9 mm handgun. By then, Newman arrived. "At no time did (the driver) inform me that he was armed," Lain wrote in his report.

"It was lucky for me," Lain said. "It was lucky everything turned out all right."

Nextel admits its towers caused the interference. "It scares the hell out of us," said Sandra Baer, a Nextel consultant in Reston, Va. "None of us wants that to happen. Police officers should be able to use their communications interference free."

Widespread problem

During its investigation, The Oregonian contacted more than 100 public safety officials in 50 states by phone or e-mail. In 28 states, this survey found at least one case in which officials confirmed or suspected cell phone towers had interfered with city, county or state radio systems. Among them:

- Every day for at least six months last year, Tigard police officers ending their shift could not sign off with the dispatch center while parked at the Police Department.
- In Portland, one of every three radio or computer transmissions has been interfered with in the past 2½ years.

The city has spent more than $50,000 researching interference and worked closely with Nextel engineers to alleviate it. But Nancy Jesuale, Portland's director of communications and networking, said their efforts have provided only isolated improvements.

"We cannot have any tolerance for interference to our communications from the galloping cellular market. It is unacceptable," said Portland Police Chief Mark Kroeker, who relayed his concerns during meetings with two FCC commissioners in Washington, D.C., last month.

- In Denver, police officers reported 60 complaints of interference since September.

"We have not encountered that life-threatening situation, but that is our concern — you're living on borrowed time," said Steven Cooper, division chief for the Denver Police Department.

- In Scottsdale, Ariz., during a seven-month period last year, police officers could not use their radios when they charged into bars to break up brawls in an entertainment district.
- In Seattle, since 1998, radios have been swamped with static or don't work at all hundreds of times each day.
- In Phoenix, Ariz., the reach of the Police Department's radio signals to its in-car computers was reduced by more than 13 percent, preventing officers from checking motorists' records for outstanding warrants.

In 21 of the 28 states, officials say they have identified Nextel as the source of the interference. In at least five other states, officials think Nextel is the cause but haven't been able to prove it. In two states, other cellular companies are thought to be the problem.

In a handful of states where Nextel signals are causing interference, other wireless companies also have contributed to the problem.

Nextel's Krevor acknowledged his company is causing interference in 12 of the 28 states: Arizona, California, Colorado, Florida, Louisiana, Maryland, New Jersey, New York, North Carolina, Ohio, Oregon and Washington. The company is working to reduce instances of interference caused by its cell towers as they become known, he said.

In the other states, Krevor said, Nextel is not the cause of interference or that he had not been notified of any problems.

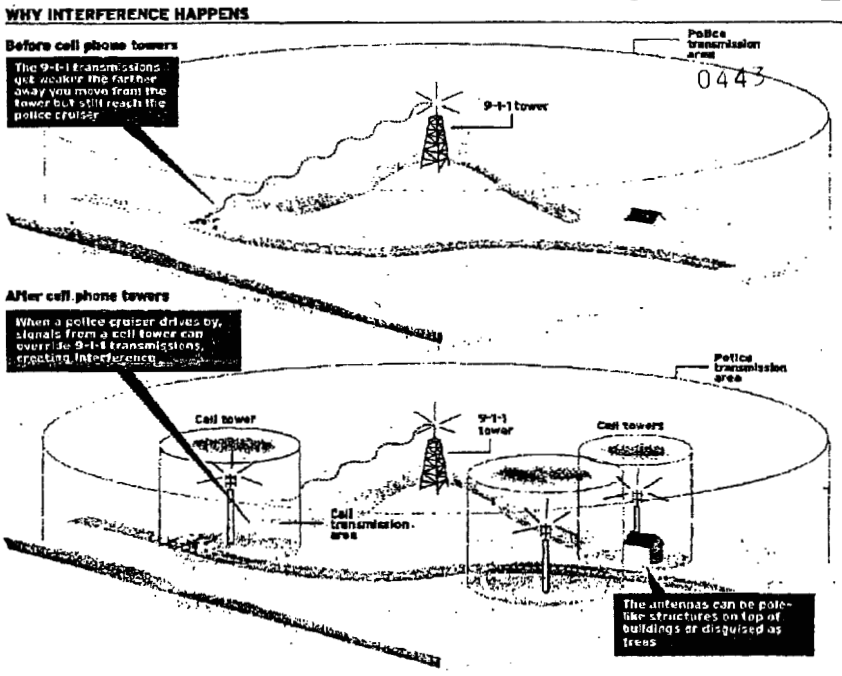
Some of the problems, public safety officials say, were handled by local Nextel staff. Officials in San Diego and Houston, among others, said they are experiencing only minor interference from Nextel towers.

But public safety officials say these aren't all the cases.

"Undoubtedly, there are people experiencing the problem that we don't know about yet," said Glen Nash, president-elect of the Association of

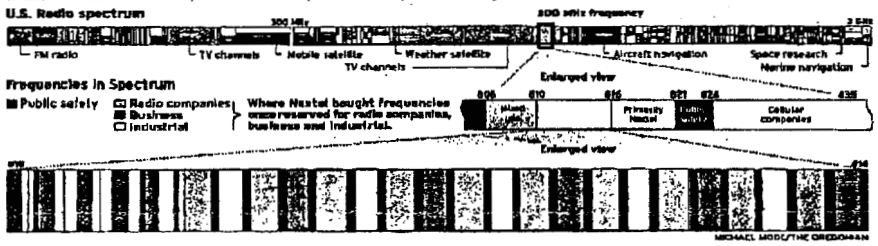
Please see TOWERS, Page A17

WHY INTERFERENCE HAPPENS



SPECTRUM ALLOCATION

The FCC made available frequencies from 1974 to 1986 for public safety agencies that were interwoven with private companies that provided radio services to taxi, tow truck and other companies. Wireless companies later bought them, leading to interference.



KEY PLAYERS

Michael K. Powell
Federal Communications Commission chairman who told Portland's Mark Kroeker and other police chiefs last month that his agency would listen to interference complaints. He made no promises to stop it.

Gloria Tristani
FCC commissioner who said the agency must draft stricter rules that prohibit interference. "This was clearly an unanticipated problem, but it's in our face right now and we need to do something about it."

Craig O. McCaw
Seattle billionaire who rescued Nextel from near bankruptcy in 1995 when he paid $1.1 billion for a share of the company.

Glen Nash
President-elect of the Association of Public-Safety Communications Officials International, a nonprofit lobbying group that represents 15,000 communications officials. He is also a senior telecommunications engineer with the California Department of General Services in Sacramento.

Joe Kuran
Radio technician with the Washington County Consolidated Communications Agency who first disclosed the interference in a story published in a trade journal in spring 1999. The article spurred engineers across the country to search for interference.

Roshara Brown
Director of Washington County's 9-1-1 dispatch center and chairwoman of a committee of public safety agencies, cellular companies and radio manufacturers that will investigate interfer nationwide. The group will m the first time today.

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Towers: Majority of states log similar reports

Continued from Page A16

Public-Safety Communications Officials, a lobbying group based in Daytona Beach, Fla.

Who's to blame?

Nextel and the FCC say they are not responsible for fixing the problem.

Nextel officials say the company is a victim of circumstance. After all, they say, the FCC approved the company's plan to build a digital network on frequencies next to police and fire departments.

"With all due respect, Nextel didn't cause *the problem*," said Robert S. Foosaner, a Nextel senior vice president and former chief of the FCC Private Radio Bureau in the 1980s.

Nextel engineers searched for potential interference before the company launched its network in 1996 but didn't find any, Krevor said.

"Certainly we didn't expect it to occur," he said. "... This is not resulting from anything we're doing outside the rules and regulations."

King County's Kearns said he has worked with the company to eliminate part of the interference and doesn't "want to characterize Nextel as the great evil. We are in the same boat. We both kind of got stuck by the FCC."

But, like Nextel, FCC officials say they couldn't have predicted the interference and they are doing all they can to fix it.

"I really think it's very unproductive to engage in fingerpointing," the FCC's Ham said. "... We're all very sensitive and do not want to cause situations where there is interference" to police and fire departments.

A report commissioned by the FCC last year said interference was an unfortunate byproduct of Nextel's popularity and police departments' demand for frequencies.

"That's what the industry wanted," Foosaner said of the 250 intertwined frequencies where Nextel and public safety departments operate. "There was nothing controversial about it. It was a no-brainer as far as the government was concerned. Unfortunately, 25 years later with the advance of technology, it has turned out to be a poor decision."

Dale N. Hatfield, chief of the FCC's Office of Engineering and Technology from 1998 to 2000, said the commission might have predicted the interference if its engineering staff wasn't so overworked.

Even if the commission couldn't have predicted the problem, some public safety officials want it fixed by the FCC, which wields broad enforcement powers.

But the FCC said it sees no need to mandate any changes because Nextel and public safety officials already are working together to resolve the issue.

Foosaner said the FCC doesn't have the people or money to spend on a solution. The FCC has one-tenth the number of employees of Nextel, and a $248 million annual budget compared with Nextel's $5.7 billion in annual revenues.

The FCC's Ham did point her finger at police departments' outdated analog radios that reel in Nextel's signals and the interference, which newer technology could deflect.

Public safety officials admit they could halt part of the interference with new radios, but police and fire chiefs are reluctant to ask taxpayers to hand over millions of dollars to pay for them.

Washington County's Kuran says the agency seven years ago spent $6.7 million on a state-of-the-art Motorola radio system with a 10-year life span. This year, the agency is planning a $9 million system update that doesn't include new handheld radios.

Portland spent $15 million on a system with a 15-year life span in 1994. The city also is in the midst of a $250,000 upgrade to beam stronger signals to the 80 agencies covered by the system.

Technicians designed the system around its known weaknesses: thick walls and deep canyons. But the Nextel interference introduced flaws the radios weren't designed to work around, Kuran said.

Repeat mistake?

Some public safety and cellular industry experts fear that the FCC is setting the stage for another midair clash — this time in the 700 MHz band.

The commission plans to allocate a section of the band for police officers and wireless companies such as Nextel.

The FCC says it has taken measures to prevent cellular frequencies from bleeding into public safety channels.

But public safety officials and those in the cellular industry, including Nextel and equipment manufacturer Motorola, say the measures are not enough.

Motorola officials say the FCC rules still allow cellular companies to use powerful transmissions that would clash with public safety frequencies, creating a virtual repeat of the problems on the 800 MHz band.

"The effect on public safety systems' coverage area would be cataclysmic ..." Steve Sharkey, the company's director of telecommunications regulation, wrote to the FCC in December.

The 700 MHz auction was most recently scheduled for September but was delayed for the fifth time last month while the FCC considers the concerns. The auction has not been rescheduled.

News researchers Lynne Palombo and Margie Guitry of the Oregonian contributed to this story. You can reach Emily Tsao at 503-294-5968 or by e-mail at emilytsao@news.oregonian.com. You can reach Ryan Frank at 503-294-5955 or by e-mail at ryanfrank@news.oregonian.com.

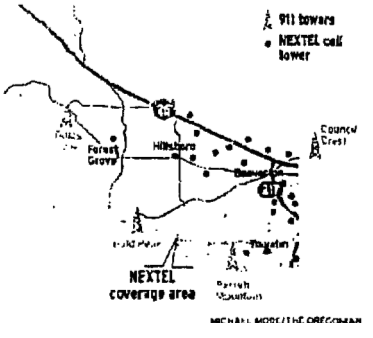
Capt. Michael Duyck and his crew at Tualatin Valley Fire & Rescue's Tigard station never know if their fire engine computers will be able to relay crucial information when they roll out on a call. A Nextel tower across the street sometimes blocks signals. "You're at the tower's mercy," Duyck says.

MARY BONDAROWICZ THE OREGONIAN

CELL TOWER CONFLICT

Washington County radio towers vs. Nextel towers

The Washington County 9-1-1 center has four radio towers. The towers are on top of peaks and beam signals into the valleys sometimes conflicting with signals from Nextel's towers.



MICHAEL MORELI/THE OREGONIAN

ON THE INTERNET

For more information, go to these Web sites:

- **Association of Public-Safety Communications Officials International:** www.apcointl.org
- **FCC:** www.fcc.gov/wtb
- **Nextel:** www.nextel.com

Agencies find fixing interference problems no easy task

Public safety agencies around the country have relied on or worked toward three main solutions on interference problems with Nextel towers:

- *Tinkering with towers:* The wireless company reduces signal strength, redirects antennas or uses different frequencies.

In Orange County, Calif., Nextel returned 150 cell sites, and communication officials say the interference was improved by 90 percent. But officials in Portland and Denver said the returned towers offered a slight but still unacceptable improvement.

- Swap frequencies: Separate the 250 intertwined frequencies into two separate blocks: one for public safety and one for Nextel.

The switch would need FCC approval. Technicians also would have to reprogram towers and thousands of radios.

In Denver, Nextel engineers and police officials are trying to compromise on who will pay the cost to trade frequencies, which Lawrence Krevor, Nextel vice president, said could run more than $1 million.

But the swap would reduce interference only in cities where the frequencies are intertwined.

- *Buy new equipment:* Police departments could spend as little as a few thousand dollars for new handheld radios or as much as $100 million for an entirely new radio system that uses another part of spectrum.

The Miami Police Department spent $5.2 million to buy 1,500 Motorola radios that eliminated 90 percent of the interference, said Louis Selema, superintendent of communications.

The Anne Arundel County Police Department in Maryland spent about $130,000 on 40 new radios that officers carry in interference-infested areas, said Capt. Gordon Deans.

No department has yet shelved an entire radio system in favor of one that uses another section of the airwaves.

"This isn't going to be a silver-bullet, magic 'snap-your-fingers, everybody sing 'Kumbaya' and go-home solution. This is hard work," said Kevin Kearns, telecommunications manager for King County.

Once Nextel and police and fire chiefs agree on solutions, the next question is: Who pays for it?

Kathleen Ham, deputy chief of the FCC's Wireless Telecommunications Bureau, said only Congress can fund fixes.

Officials with Nextel and police and fire departments say they shouldn't pay because they didn't create the problem.

Krevor said Nextel has already spent more than $1 million researching interference. Sandra Baer, a Nextel consultant, asked, "What is the appropriate cost-sharing? We're not a bank."

0445

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To search the papers at this web site, type your search word (example "orange" - less the quotation marks) in the above text box and then click on the 'search' button

Health effects associated with mobile base stations in communities: the need for health studies :

Dr. Neil Cherry : 8 June 2000 Environmental Management and Design Division
P.O. Box 84 , Lincoln University , Canterbury, New Zealand , email: Neil.Cherry@ecan.govt.nz
Dr. Cherry's graphics are just too 'big' for this site (limited to 2Meg storage). Each can be viewed at www.geocities.com/miscgrafs/cherrypics/ by clicking on the relevant underlined "Figure.number" below.
For feedback, messages, articles for publication please use this *form.*

Abstract

In 1995 a New Zealand Environment Court (as the Planning Tribunal) decided to set a public exposure limit of 2μ W/cm^2 for from a BellSouth **GSM** cell site. This was based on evidence of biological effects, including calcium ion efflux, enhanced ODC activity and **EEG** change down to 2.9μ W/cm^2. There was also epidemiological evidence of childhood leukaemia at 2.4μ W/cm^2. The primary expert witness for BellSouth was WHO staff member Dr Michael Repacholi from Australia. He stated that there was no evidence of adverse effects below the international guideline of SAR = 0.08W/kg because the only effect of RF/MW was tissue heating. The Court's decision rejected this position and set the exposure level of 1% of the standard. The decision also stated that this should be revised with new evidence. Subsequently two Australian studies were carried out to assure the public that both cell phones and cell sites were safe. Both of these studies, Hocking et al. **(1996)** and Repacholi et al. (1997), showed that leukaemia/lymphoma was more than doubled for people and mice.

It is now clear that the results of both of these were quite predicable from earlier human and rodent studies. This includes studies that are claimed by ICNIRP, WHO and Dr Repacholi (both in reviews and in the Environment Court) to show that there were no adverse effects. To this day cell phone companies and some government bodies, such as the **U.K** independent expert committee, chaired by **Sir William Stewart,** that included Dr Repacholi, **still claims that there is no evidence that cell phone radiation is harmful.** There is a large and growing body of published scientific studies that show that **this is not true.** This includes **Dr** Repacholi's own research. Over forty cell phone radiation studies are cited here. They show that **cell** phone radiation mimics the biological and epidemiological studies **for** EMR over the past 4 decades. This includes **DNA strand breakage, chromosome aberrations, increased oncogene activity in cells, reduced melatonin, altered brain activity, altered blood pressure and increased brain cancer.**

Analogue cell phones use FM RF/MW signals and digital cell phones use pulsed microwaves that are very similar to radar signals. FM radio, radar exposures cause significant and dose response increases in **brain cancer, leukaemia and other cancers, and cardiac, neurological and reproductive health effects.** Hence it is highly probable that cell sites and cell phones are causing many adverse health effects. Already cell phone radiation has been shown to significantly increase **all** these effects.

Public health surveys of people living in the vicinity of cell site base stations should be being carried out now, and continue progressively over the next two decades. This is because prompt effects such as miscarriage, cardiac disruption, sleep disturbance and chronic fatigue could well be early indicators of the adverse health effects. Symptoms of reduced immune system competence, cardiac problems, especially of the arrhythmic type and cancers, especially brain tumour and leukaemia are probable. However, since cell phone radiation has already been shown to reduce melatonin, damage DNA and chromosomes, surveys should look for a very wide range health effects and not be limited to a narrow set. In carrying out health surveys, the researchers must be mindful of the actual and realistic radiation patterns from **cell** sites and not to make the

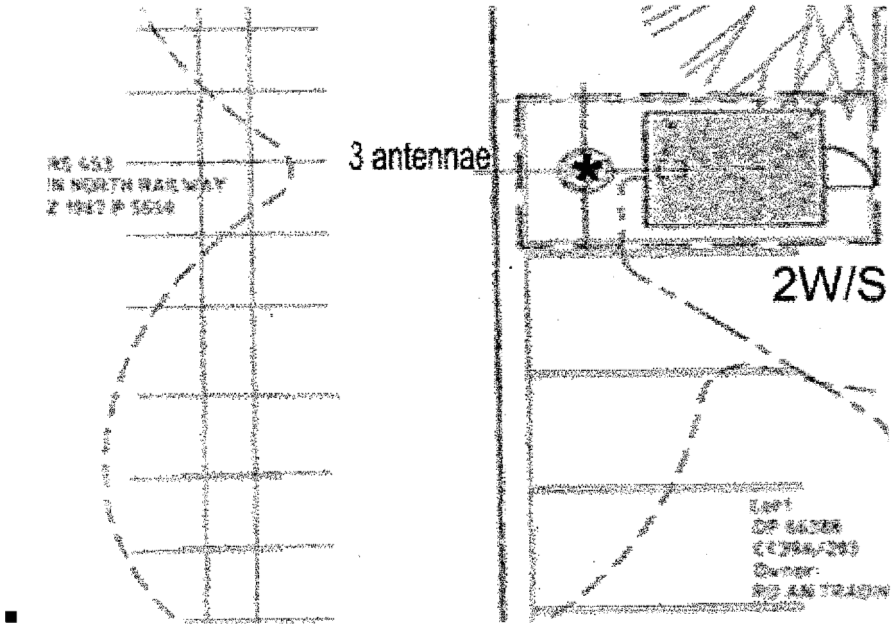

Figure **29:** Three-panel horizontal radiation pattern, for a low powered site, as for the Elmwood Site.

Conclusions:

To over **40** studies have shown adverse biological or human health effects specifically from cell phone radiation. These research results to date clearly show that cell phones and cell phone radiation are a strong risk factor for all of the adverse health effects identified for **EMR** because they share the same biological mechanisms. The greatest risk is to cell phone users because of the high exposure to their heads and the great sensitivity of brain tissue and brain processes. **DNA** damage accelerates cell death in the brain, advancing neurodegenerative diseases and brain cancer. Brain tumour is already an identified risk factor. Cell phones are carried on people's belts and in breast pockets. Hence liver cancer, breast cancer and testicular cancer became probable risk factors.

Because the biological mechanisms for cell phone radiation mimics that of **EMR,** and the dose-response relationships have a threshold of **ZERO,** and this includes genetic damage, there is extremely strong evidence to conclude that cell sites are risk factors for:

- **Cancer, especially brain tumour and leukaemia, but all other cancers also.**
- **Cardiac arrhythmia, heart attack and heart disease, particularly arrhythmia.**
- **Neurological effects, including sleep disturbance, learning difficulties, depression and suicide.**
- **Reproductive effects, especially miscarriage and congenital malformation.**
- **Viral and infectious diseases because of reduce immune system competency as associated with reduced melatonin and altered calcium ion homeostasis.**

A recommended risk reduction target for the mean chronic public exposure is 10 nW/cm^2.

To Planning commissioners 8/14/01 and 6/4/02

0447

The Telecommunications Act of 1996 bars municipalities from considering the health effects of microwave radiation in the siting of cell tower wireless communication facilities. Subsequent legislation went a step further and released telecommunications corporations from many liabilities stemming from health risk factors created' by their cell towers. Over 40 cell phone radiation studies * worldwide have drawn careful conclusions Which indicate the telecommunication industries have serious liability issues which will come due in the future. Once these issues become quantified, property values surrounding cell towers may plummet on the order of such other environmental disasters as Love Canal and Three Mile Island.

In order to protect the people of Santa Cruz County, any telecommunications corporation desiring to site a cell tower/ wireless communications facility should be required to waive their exemption of liability under the Telecommunications Act and carry sufficient liability insurance as a precondition for receiving a permit. If these facilities are as safe as the industry claims, then they should have no objections to these requirements. If, on the other hand, there is data which is being suppressed or ignored, then we can: expect them to hide behind this special interest legislation.

Any other business in Santa Cruz County, with the exception of a nuclear power plant (similarly exempted by the Price–Anderson Act) would be considered derelict in its corporate responsibility if it did not carry sufficient insurance to protect the public from accidents or mishaps.

We are asking the Santa Cruz County Board of Supervisors and S.C. City Council to not grant any permits for cell tower/wireless communication facilities unless Sprint, Cingular, Nextel, Verizon, Cellular One, AT&T, Skytel, Metricom, etc.' have agreed to these insurance liability conditions,

Sincerely,
Marilyn Garrett
688-4603

* Dr. Neil Cherry 8 June 2000 Environmental Management and Design Division, Lincoln University, New Zealand, in citing these studies concludes:

> They show that cell phone radiation mimics the biological and epidemiological studies for EMR over the past 4 decades. This includesDNA strand breakage, chromosome aberrations, increased oncogene activity in cells, reduced melatonin, altered brain activity, altered blood pressure and increased brain cancer.

http://pages.britishlibrary.net/orange/cherryonbasestations.htm

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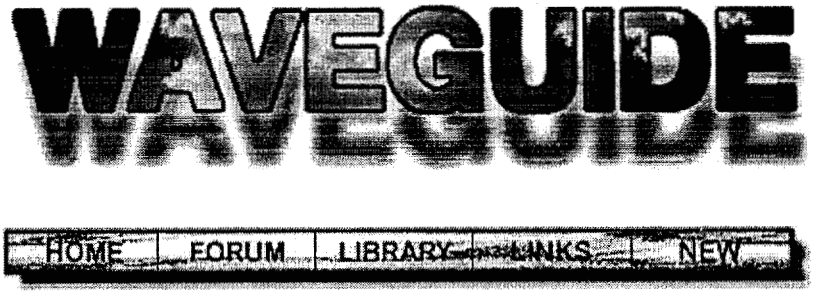
We are irrevocably altering the electromagnetic signature of the world. And we are doing this with no clear understanding of the implications to humans or other species.

From this article, which appeared in the ***Network News,*** *Summer, 1997, by B Blake Levift*



A Clear Call

America Unplugged-A Guide to the Wireless Issue

by B. Blake Levitt

The following was presented by award winning author B Blake Levitt at the Berkshire-Lifchfield Environmental Council: Environmental Tower Siting Conference, held in Connecticut on May 70, 1997.

As the author of a consumer-oriented book on electromagnetic fields, which has an inclusive section on the radio-frequencies, I get calls from all over the country from worried homeowners and parents with telecommunications towers going up in their communities. I also get calls about satellite uplinks and power lines, and radio and TV towers. But by far, the greatest number of calls are about cellular and PCS Systems, usually from extremely distraught people who have suddenly discovered that a cellular tower is planned near their homes, or on their children's school property.

Their driving concern is always the medical issues, with aesthetic concerns, and property devaluation following closely behind as part of the entire package. They are typically appalled to find out that their local governing agencies, as well as their boards of health, are not only uneducated on the health issues, but often apathetic and powerless to boot. And they are enraged that the telecommunications companies claim to have the ability to place towers in communities that don't want them. Most people at the local level, citizens and municipal agents alike, know nothing about the preemption moves by the telecommunications companies at the FCC over the last few years. But when they find out, they become angrier. The anger is often directed at the perceived apathy and incompetence of the planning and zoning officials. In Connecticut, it's often directed at the state siting council.

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Every community across the country is facing what we are talking about here today. In fact, most communities have been involved with tower siting battles for several years now. Litchfield County has been very lucky so far. There are people in this audience from other states, and different areas of Connecticut, with war stories to tell us.

This is a serious business. An estimated 100,000 new cellular towers utilizing the 800 to 900 MHz frequencies (the so-called "old" Systems) are scheduled to go online across the country by the year 2000. An additional four new PCS carriers using the 1 to 3 GHz range were recently approved by the FCC for each area. That system will add many hundreds of thousands more. PCS antennas need to go every 2 to 8 miles apart. That's 2 to 8 miles apart, times the four carriers. The systems don't share frequencies so they all need their own antennas. By law, we have to site all four. That's a lot of antennas. Litchfield County cannot remain unscathed much longer, especially with our substantial population of weekenders who bring high discretionary incomes, and who already own cellular phones which do not work out here.

Siting the antenna necessary for the technology is a planning and zoning nightmare, and a serious threat to our health and environment in ways that Congress simply did not understand when they passed the Telecommunications Act of 1996. Legislation moved so fast through the last Congress that most of the legislators in Washington, who were voting on the Telecommunications Act, didn't even know what the implications of those preemption clauses were to their constituents back home. Now everyone is finding out, and no one is happy about it. Legislators all over the country are getting flack for this, and major sections of the act are likely to be revisited by Congress.

FCC Cheerleading Squad for Industry

Many observers think that the FCC is a government agency run amok under the directorship of Chairman Reed Hundt, a man with a reputation as a rigid free-market ideologue and a technophile. He seems more interested in stimulating the economy, and auctioning off our air waves, than in monitoring the communications companies. Martin Nolan, the respected Boston Globe columnist recently called Hundt's FCC "a cheering squad for the industry it supposedly regulates." Many also think that the very limited frequencies of the electromagnetic spectrum, which belong to the U.S citizens like our national forests and other important resources, should not be sold off to private corporations without a public debate on the order of what occurs when logging or oil drilling rights are sold in our forests. But such a national debate about selling the spectrum hasn't occurred, probably because the very finite "real-estate" that is the spectrum is invisible. It remains a monumental

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public policy issue that very few of us, as citizens, have had an opportunity to comment on before this telecommunications buildout occurred. The FCC is bending over backwards to help the industry, but no one is really protecting the best interests of the citizens, or the communities. And the subject seems so esoteric to most of us, that we are unaware of the fact that we should be concerned. Until, of course, a tower goes up in our back yard...

Before the Telecommunications Act became law, numerous communities across the country were simply banning cellular phone towers outright. Irate citizens who looked at the health issues, which are real, simply refused to take the risks and insisted their town governments back them up-- which many did. The industry's response back in 1993 was first to petition the FCC to preempt all state and local zoning. Very few people knew this was happening at the federal level. It was a major power-grab of local and states rights by the telecommunications giants. Not since the robber-baron days at the turn of the last century, and the building of railroads, has there been such contempt for local land-use authority. There was not a single press article on the preemption moves at the time, that I am aware of. The petitions were filed two days before Christmas, after government officials had left for the holidays, and at a time when it was thought that most FCC observers would be otherwise occupied. There was only a 30-day public comment period. Nevertheless, a number of people, including several activists in this room, managed to get the word out quickly so that others, like the American Planning Association, the Connecticut Siting Council and Attorney General Richard Blumenthal, among others, had the opportunity to comment.

The FCC, by its own admission, is a licensing and engineering agency which defers to other agencies for research and standards setting. It wisely turned down the preemption requests because to do otherwise would have been flagrantly outside their authority, not to mention against the 10th Amendment of the U.S. Constitution. Industry then went searching for a legislator to champion their cause at the legislative level and found one in Senator Klug from Wisconsin who introduced preemption clauses into the huge and complex telecommunications bill. Again, there was a mad scramble to educate concerned people and organizations about this new power-grab. Activists were frantically lobbying representatives and senators, who knew nothing about why these clauses were in there, or even what they meant. They certainly didn't know that there was a raging debate about the health effects of the radio-frequencies that had been going on for decades in scientific circles. A last ditch, bipartisan effort by Senator Diane Feinstein, a California Democrat, and Senator Kernpthorn, an Idaho Republican, tried to remove the clauses, but that effort was defeated by a narrow 56 to 44 margin on the Senate floor. That will give you an idea *of* the kind of pressure

that legislators have been under from their constituents to not allow this industry to have a clear, carte blanche shot at the country, as if there were no problems with this technology. But industry prevailed, due in large part to the pro-business, anti-environmental attitudes of the last Congress, a deal-making Clinton administration, and millions of dollars poured into re-election coffers by the telecommunications companies. Ask Senator Joseph Lieberman how he voted. And ask how much money the telecommunications companies donated to his campaign.

What became the law of the land in Section 704 of the Telecommunications Act was this: State and local governments preserve their authority over the placement, construction, and modification of personal wireless services. But they cannot discriminate among providers, nor prohibit -directly or indirectly - the provision of such services. The section further preempts State and local regulation of such placement on the basis of the environmental effects of radio-frequency emissions, to the extent that such facilities comply with the FCC regulations for such emissions. That last statement goes directly to the heart of the problem. It's also like having an elephant in the room and trying to ignore it.

Local vs., Federal Control

Many people inside and outside of government know that all of this is on legal thin ice. Even the FCC admits they are surprised that no one has challenged this at the federal level yet, with an eye toward a Supreme Court case. Everyone seems to be waiting for that one tenacious community, with deep pockets, to draw the line, and just say no. There are significant legal issues regarding zoning and siting determinations; challenges to health and public policy authority regarding radiation standards-setting; property-rights and illegal takings regarding real estate devaluation; and even free-speech issues regarding our ability to simply discuss the environmental effects of the radio frequencies at local planning and zoning meetings. These are a lot of rights that are in danger, and it's a classic battle of local vs. federal control.

The telecommunications industry is not a "nice" industry. The representatives who appear at the local level are usually great. More helpful people you won't find anywhere. They always want to "work with the towns." Offer to pay for fire, police and ambulance radio services on top of their own. That's an intentional strategy. They hold workshops to teach them this approach. And they teach them how to handle the media. But the industry behind the scenes is a multi-billion dollar conglomerate that plays big-time political hardball. Local zoning regulations are a major hassle to them and they want us out of the way, except as users and payers for their service.

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Industry Moves to Ban Moratoriums

Among their most recent moves -- which, again, most people are unaware of, and about which the press is asleep - include a request that the FCC ban local communities' ability to set temporary moratoriums; and a request that the FCC declare it illegal for communities to make the providers prove that they are in compliance with the RF emissions regulations. They are also trying to get the FCC to forbid discussion of the RF health effects at zoning hearings. But the most ominous move is going on as we speak. Industry has asked the Senate Commerce Committee to preempt all state and local siting authority again, to consider telecommunications as an interstate commerce issue. That committee does have the authority to override state's rights. There's a two-week comment period that will start ticking around Wednesday. Consumers have been banned from commenting at the hearings. Industry is heavily represented. It's difficult to get any information about it' but I urge people to write. And Reed Hundt may declare moratoriums illegal as soon as next week. Well over 300 towns across the country have moratoriums in place. Industry doesn't want us to study this situation. The FCC is happy to oblige. Hopefully, there will be a public outcry that will include the voices of the people in this room.

All of this is by the way of political background. I'm a firm believer in understanding the big picture before getting to the nitty-gritty. But my real job here today is to talk about the medical and science issues. I hope to scare the planners and zoners in the room into doing the right thing to protect the towns. I hope to inspire the legislators in the room to re-think these laws and maintain local control. And I hope to encourage everyone to write their legislators who are not present, and say enough is enough.

Despite the preemptions, there's a great deal that we still can do. You just have to know why certain recommendations are being made in order to take them seriously. It's very tempting to consider the prospect of communications towers on scenic ridgelines or in neighborhoods as merely an aesthetic problem. And it's also very tempting to just hide them in church steeples, or on barn silos, or atop tall buildings, or to shield them in state forests. That's what you do to solve the aesthetics. But the health and scientific problems associated with this technology are much more complicated than that -as the telecommunications industry well knows.

The Medical Issue

So what are these medical issues, and what research backs them up? First, let me emphasize that at its core, this is a medical issue. The aesthetics and property devaluation problems are a by-product

of the main concerns and will fall into line when the medical consequences are better understood.

When the industry talks about "environmental" effects, they mean health effects in humans. They are so afraid to say "health effects" and "cellular phones" in the same sentence that they have made the language fuzzy. The research for the radio-frequencies is nowhere near as abundant as it is for the 60 Hz power line frequencies. Some would say this is not an accident; that you can't find what you're not looking for. But a substantial amount of research does exist, certainly enough to get the general lay-of-the-landscape.

One central problem exists with the RF research, though. Scientists are impatient humans like everyone else, and they want answers to their questions quickly. A lot of the studies used to determine human exposure standards are based on high-power, short-term test designs that are then used to extrapolate downward in order to arrive at presumed safety levels. But most exposures to the radio-frequencies in the real world, especially for those living near antennas, are of the long-term, low-level variety. These have very different biological parameters associated with'them. So a lot of the research that's been done is of an inappropriate kind, and it's being used to reach inappropriate conclusions. The low-level, short term studies are much fewer, but every one of them is disturbing.

Radiation is a natural part of the universe. We are bathed in a constant stream of electromagnetic radiation produced by the power of the sun's solar winds, which give off high-energy ionizing radiation like x-rays, infrared, ultraviolet, gamma and cosmic rays, and some radio/microwave frequencies too. These interact in a complex way with the magnetosphere, which protects the earth from this barrage otherwise we wouldn't exist on this planet; as well as the ionosphere and the atmosphere closer to the earth.

The earth itself is a giant dipole magnet (like those little bar magnets we all played with as kids) containing a north and a south pole. Micropulsations in the 1 0-hertz frequency range constantly emanate from the earth's core. Scientists used to think these micropulsations were an interesting but meaningless phenomenon. Today they think all living things are in a complex relationship with it; entrained by it, in fact. Entrainment phenomenon can be thought of as what occurs when a mother and child sleep together and their breathing rates synchronize. Energy is what we respond to, like plants to light. Every living thing is in harmony with these subtle signals. It's been found to control our most basic circadian biorhythms, our sleeping/waking cycles, important hormone production such as melatonin, and some crucial aspects of cell division itself. Human brain waves, in fact, function mostly around the 10 Hz frequency, just like these rnicropulsations. Other species

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also rely on this natural magnetic background. It is known to determine bird and butterfly migration patterns for example, among many other things.

Not All Energy Is Alike

But not all energy, which is expressed in wavelengths and frequencies, is alike. Nor is its properties, or effects. The electromagnetic spectrum is divided into ionizing and non-ionizing radiation. Ionizing radiation, like x-rays, is powerful enough to knock electrons off of their cellular orbits and therefore cause genetic mutations. The non-ionizing bands, like the microwave and radio frequencies, aren't powerful enough to do that, but can cause a range of other reactions such as tissue heating, like what occurs in a microwave oven. The dividing line between ionizing and non-ionizing radiation is in the visible light range, around the ultraviolet band, but no one can say precisely where one leaves off and the other begins. This is a concern for consumer products like color TVs and computer monitors which are multi-frequency products. A TV plugs into the wall at the extremely low frequency power line range of 60-hertz, and utilizes energy all the way up through the light frequencies. At the top end of the range, x-rays and UV particles are being given off. That's why it's a good idea to sit at least six feet from such screens.

Most medical doctors know nothing about this. What we're talking about are the sub specialties called bioelectromagnetics and biophysics -- arcane disciplines that are not taught in medical schools. But it has been known for years that the human anatomy is actually resonant -- in the strict physics sense of the term --with the FM-frequency bands, and that the brain reaches peak absorption in the UHF bands -- right where cellular telecommunications operate. Some researchers think that a worse frequency could not have been chosen for the emerging technology regarding the human anatomy. Resonance, by the way, is what happens when an opera singer hits high-C in the presence of a crystal glass for a sustained period, and it dramatically shatters.

Light Bulb Theory Burnt Out

Telecommunications representatives at public hearings and in the press routinely blur the distinctions between frequencies, likening their installations to 25 and 100 watt light bulbs in an attempt to confuse and placate concerned citizens What they leave out is that their systems operate at ultra high frequencies (UHF) in the microwave bands, which are maximally absorbed by human tissue. And they also don't specify that each channel is 100 watts. Channels can be split as user demand increases, and there can be hundreds of channels on some towers. This is no longer a low-

powered transmitter suitable to sit on top of someone's barn silo, but rather something closer to the power output of a local AM-radio station. It is crucial that the towns be careful where they initially allow these installations to go. Any installation site will inevitably grow as others piggy-back onto it. And because they are what's called "line-of-sight" technologies, the initial sites will also determine the placement of the others. A regional plan is imperative if Litchfield County, ten years from now, is to look anything like it does today.

Not Safe At Any Level

But again, it's not just about aesthetics. Research exists to indicate that there are some frequencies which may be unsafe at any intensity, no matter how low the power is turned down. This is a critical point in siting considerations. The FCC standards are based on what's called a "thermal model", meaning the RF-frequencies ability to heat tissue like microwave ovens cook food. It is presumed, in thermal models, that if the power is turned down low enough, or if exposures are kept short enough, heating will not occur -which is true And so each time a tightening to this standard is attempted, either the length of the recommended exposure is reduced (which no one abides by anyway), or the power is turned down. But this is not enough.

Serious Nonthermal Effects

A range of non-thermal effects have been observed since the 1940's when the U.S. Bureau of Ships began studying health effects in Navy radar personnel during World War II. In 1953, Dr. John T McLaughlin, a medical consultant at the Hughes Aircraft Corporation, noted for the first time in radar workers, internal bleeding, leukemia, cataracts, headaches, brain tumors, heart conditions, and liver involvement with jaundice, as effects from microwave/radar exposures. Other early research found disturbing blood abnormalities, cataract formation, and various cancers at non-thermal exposure levels.

Another early researcher, Dr. Allen Frey, reported in 1975 changes in the blood brain barrier in rats exposed to pulsed microwaves -- similar to what's used in today's new digital PCS systems. Increased blood brain barrier permeability has since been noted by several other researchers as well. The blood brain barrier is what protects the brain from access by any number of toxins, bacteria and viruses. It's not a good thing to tamper with its sentinel functions. Frey also noted in his early work -- which he recalled at an FDA conference -- that he and his laboratory assistants, as well as their test subjects, all developed severe headaches during the course of their microwave studies. He resolved back then not to use humans as test subjects after that.

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The Body Electric

Frey's recent comments are in response to thousands of complaints about headaches in cellular phone users that are now surfacing around the world, much to the amazement of mainstream medicine. But anyone who knows anything about this subject is not surprised by these so-called "new" reports. Humans truly are "electrical" beings. The heartbeat is electrical. Brain waves are electrical. Most hormonal and neuronal activity is electrically regulated. Some crucial aspects of cell division itself are too. In humans, the eye was thought to be the only organ that had evolved to perceive a band of the electromagnetic spectrum --that of visible light. But recent research has found that the pineal gland, located deep within the center of the brain, is probably a "magnetic" organ which determines our sense of direction, among other things. One could argue that not much happens in the human anatomy that isn't electromagnetic. So why wouldn't we react negatively to some frequencies, or, then again, positively to some others? In fact, many non-ionizing frequencies are used therapeutically, because of their deep penetration ability. Diathermy treatment is an example. And laser surgery, which is widely used today in surgical practices and a great improvement over traditional scalpel methods, uses highly concentrated light frequencies of different colors. Each color has its own properties. So how good an idea can it be to have a cellular phone transmitter placed against the head on a regular basis? Those transmissions go directly through brain tissue. Living near a cell tower does the same thing.

Most laypeople understand this on a powerfully intuitive level. We experience ourselves as whole "energetic" beings - as far more than the mere sum of our individual parts. It's easy to intuit that there could be a problem if we are subjected to an array of artificial energies. And that's why those who live near telecommunications installations are worried and threatened, and why parents acr6ss the country try to stop towers from being sited on school property. It isn't because they are hysterical NIMBYS, or anti-technology, as industry would have us believe. These become involuntary exposures when people are forced into them.

Without going through a long list of research findings, which usually bores everyone, let me point out just a few high spots... For those who want more detail, there's plenty in the book ...

Here's what's been recently observed that translates to this technology, and hopefully to your planning and zoning, and legislative decisions...

Adey Research

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There's the window-effects work of Dr. William Ross Adey, a neuroscientist at the Veteran Administration Hospital in Loma Linda, California, and Dr. Carl Blackman, a biophysicist at the EPA Center at Research Triangle Park, in North Carolina. These two researchers have found in a series of studies that the human anatomy has critical "windows" which responded to some frequencies, but not to others. At set intervals in the non-ionizing bands, they observed changes in calcium ion flow. Calcium is the body's information "currency." Cells use it for any number of critical functions. It's not a good thing to tamper with. What they actually found was a kind of ion channel "dumping" of calcium that was quite dramatic. It could have effects on many cell functions, including cell division.

Szmigielski Findings

Then there's the on-going work of Dr. Stanislaw Szmigielski and his co-researchers at the Center for Radiobiology and Radioprotection in Warsaw, Poland. In microwave and radar personnel, they have noted sharp increases in cancer - including lymphomas, melanomas, leukemias, and brain tumors - high blood pressure, headaches, memory loss, and brain damage. They also noted immune system abnormalities; first an over-stimulation, then later immune suppression after continued exposure to low levels of the microwave bands. That's an important observation with this work because sometimes researchers note immune system enhancement and conclude that some of these exposures are actually good for people. In fact, Ross Adey completed work this year for Motorola studying test animals for exposures like those of cellular phones, and found just such a probable immune enhancement -- at non-thermal levels. Some in the popular press extrapolated from this that cellular phones protect users from brain cancer. Researchers need to continue the tests beyond that initial phase to see what really occurs.

Guy Examination

In 1984, Dr. William Arthur Guy, at the University of Washington in Seattle, found an increase in malignant endocrine gland tumors, and in benign adrenal gland tumors in test animals. This was a five-year, $5-million dollar study of long-term, low-level exposures that was funded by the U.S. Air Force. The study also indicated immune system malfunctions in that nearly all of the initial test animals died from infections. The studies had to begin again from scratch.

Lai Singh Investigation

In 1994, Drs. Henry Lai and N.P. Singh, at the University of Washington, Seattle, found both single and double-strand DNA

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breaks in test animals exposed to cellular and PCS-frequency pulsed microwaves. Double-strand DNA breaks are thought not to repair themselves and can lead to mutations. Dr. Lai just announced at an FDA workshop on this subject that in recent follow-ups, they noted that such breaks were blocked by the hormone melatonin. Melatonin, in several studies has been found to be suppressed in power line frequency exposures. Often, wireless technology is "modulated" with such ELF frequencies. There are complex synergistic relationships with many of the non-ionizing bands that fall well outside the range of thermal effects.

Repachoil Research

A recent Australian study hot off the presses that hasn't been reported in America yet, has found a significant increase in B-cell lymphomas in test mice exposed to long-term, low-level pulsed microwave frequencies in the cellular and PCS range. Changes in B-cells in the immune system are implicated in roughly 85% of all cancers. The study was funded by Telstra, the telecommunications conglomerate, and headed up by Dr. Michael Repacholi, an industry researcher widely known to espouse that cell phones are safe. Additional significance of this study is the fact that these changes occurred at what are called "far-field" exposures, not the near-field exposures such as would be experienced by cell phone users themselves. This has implications for those living near transmitter sites, as well as those in the immediate presence of people using cell phones. It's like the secondary smoke issue. Stand back from someone using a wireless device. Even the FDA recommends this, but few people know about it.

Kirschvink Findings

Another important body of work comes form Dr. Joseph Kirschvink, a geobiology professor at the California Institute of Technology. In 1992, Dr. Kirschvink discovered magnetite in human brain tissue in the blood brain barrier and the meninges which covers the brain. Magnetite interacts a million times more strongly with external magnetic fields than with other biological material. Although it has been known for years that bees, butterflies, birds and fish manufacture magnetite - often in thick clusters, or in long crystal chains, and use it as a navigational tool, it was thought that humans did not manufacture their own magnetic material. Any regulations for these technologies which surround us are based on a presumption that humans do not manufacture magnetite. This body of work has profound implications for the safety of MRI scans for instance, as well as wireless technologies.

Bise Research

Another study that I find haunting was conducted by Dr. William Bise in 1975, using ten human test subjects. Bise found severe alterations in human electroencephalograms at microwave and radio-frequency power levels that have now become common in many urban areas. The year-long study documented a kind of entrainment of test subjects brain waves with the external exposures, and radical changes in mood and behavior. That study alone should give us pause. Some frequencies are known to suppress serotonin production in the brain. Low serotonin is implicated in depression (that's what Prozac boosts), in increases in suicides and in violent aggressive behaviors.

Other researchers have noted significant increases in cancers of the liver, and breast cancers in RF/MW exposed groups -- all at levels thought to be safe, and which fall well within the FCC standards of today.

FCC Standards Inadequate

I trust everyone is getting the general theme... The research exists, and it is credible. It's a question of pulling it together and seeing it for what it is. I've only scratched the surface of it here. The FCC standards that are supposed to protect us, are inadequate. What's important to know, as planners, is that although you can't set more stringent standards at the moment, you can site installations in a way that accomplishes the same thing. It often takes decades for public policy to catch up with scientific research. We need to err on the side of caution as best we can in writing zoning by-laws. It's the one real handle we actually have.

An amazing paradox keeps popping up in this research. It's something that is usually ignored, probably because we just don't know what to make of it. The paradox is this: It is often observed that the most profound bioeffects occur at the lowest intensities... Researchers call it a "non-linear effect." It's probably due, in part, to entrainment phenomenon, and our relationship with the earth's natural fields. In the past, when an environmental "pollutant" has been identified, we've surmised a theoretical safe level and tried to regulate it there. But if the energy modalities turn out to be more bio-reactive at the lowest levels, what does this do to our common regulatory wisdom? It turns it completely upside down.

It looks like we are dealing with a new scientific model with these energy modalities. The cutting edge of most medical research is quietly undergoing a paradigm shift that's so subtle, that most researchers and clinicians are unaware of it' even as they incorporate it into their own practices. We are gradually shifting our understanding of the human anatomy from the familiar chemical-mechanistic model, to a much more refined, interesting, and

complex emphasis on the human anatomy as a coherent electrical system.

With the wireless juggernaut now sweeping the country, however, an immense problem arises. Our standard regulatory approach is based on the conventional toxins model, such as chemical pollutants. But if we are dealing with a new model in which the most profound effects occur at the lower exposures, that toxins model is not only ineffective, but may actually be detrimental. We simply don't know. In the meanwhile, this technology is creating a seamless shield of new exposures in extremely close proximity to the population for the first time in our evolutionary history, often with characteristics -such as digital signaling and unusual wave forms, that are simply not found in nature. We are irrevocably altering the electromagnetic signature of the world. And we are doing this with no clear understanding of the implications to humans or other species.

Don't let anyone tell you that the addition of these wireless services is just a drop in the bucket given that "energy happens." It's just not so. And perhaps if more consumers understood the legitimate medical issues which underlie this, namely that it may not be a good idea to have a transmitter of any kind against one's head -- no matter how low-powered, that fewer people would be rushing to buy cordless and cellular phones. If consumers understood that when they use wireless products, they are not just irradiating themselves but everyone else around them too, they might re-think their use of such devices.

What To Do Now

So what would be helpful right now? Given the fact that the horse is already out of the barn, and we're probably going to have to site some towers... Others' will speak to these points but here's a fast glimpse:

1. Institute 6-month moratoriums while you study the options. Have something on the books, or at least ready to go in case applications come in.
2. Write effective planning and zoning by4aws that establish "by-right" zones where telecommunications facilities can be sited, but nowhere else. Keep these zones away from residences, schools, hospitals, and nursing homes. (New Zealand, by the way, bans them on school property.) Establish large set-backs near such areas. If the towns own the land, and I recommend that they do, they can control the area around the facilities, and reap the licensing fees to benefit the taxpayers.
3. Don't allow private entrepreneurs to start telecommunications installations -- especially in residential neighborhoods. Most of

the time, such entrepreneurs don't have the vaguest idea what they are getting involved with. This has become a nightmare in some communities. As installations grow, which they inevitably do, they become extremely complex, hazardous electromagnetic environments that become impossible to measure. Farmers in particular are vulnerable to approaches from the industry. While everyone wants to see our farmers make a good living, this can actually devalue everyone's property - including their own. It also opens them to liability suits for a number of claims. There is no statute of limitations for EMF suits for health damage. There is also a move by industry at the FCC to shift all liability onto the site owners. Most people who are approached, or who offer their own land, are not told any of this, and they rarely know about the health effects other than what industry literature tells them.

4. Don't be tempted to lease space on town-owned buildings if those buildings are near populated areas. Don't be tempted to hide them inside silos or church steeples. This is not just about the aesthetics.
5. Make sure you have tower-sharing regulations in your zoning laws. Make every tower or new antenna array justify its placement. if existing towers are present, make newcomers lease space there, rather than establish new sites. Make them prove from an engineering study that existing sites won't work. Economic reasons are not good enough to justify new tower sites. Get independent engineering reviews and make the companies pay for them. In cases where development has encroached on existing installations, either move the transmitters, or buy out the residents.
6. Establish regional transmitters, and group as many RF users together as possible. Create large setbacks near such facilities (miles, if possible - not just feet), and regularly monitor them. Measure the ambient backgrounds at different distances and heights. Pay particular attention near metal objects and structures like water towers and metal roofs. High RF concentrations can occur near them. Keep a log at zoning offices and health departments. We have an unusual opportunity in Litchfield County to explore a regional approach. That option has already been lost in more populated areas of Connecticut.
7. Establish regular emissions monitoring, using specific measurement protocols, or all transmitters by independent licensed RF engineers. Require that the companies pay for this monitoring on an annual basis. The state cannot, and will not do this. Neither will the siting council. Communities have been asking them for years. One engineer can be shared by several towns. If a facility is found in violation of the FCC standards -- either by single users or in the aggregate -- impose daily fines until compliance is reached. After a set

time, shut them down if the problem is not fixed.

8. Require pre & post testing, according to specific measurement protocols. Measure before a transmitter goes online, and after it goes online. This is the only way to accurately assess what we are changing in the environment, and when. It is also the best way to provide medical researchers with a baseline guide for future epidemiological studies. Such studies are often thwarted by the absence of this exact piece of information.
9. Restore and protect state and community rights in tower siting. Local communities know their typography much better than a distant engineer's computer model, or the siting council. And if a majority of people in a town want to live in a wireless dead spot -- that's their right. Let them.
10. Encourage satellite-based systems, such as Motorola's Iridium Network, which will greatly reduce the number of ground based transmitters. For those who use cellular phones, inform them of the associated risks with the higher-powered handsets that would have to accompany such a distant system. At least these exposures would then be voluntary, and hopefully based on informed consent.
11. Declare in your regulations that wireless technologies are not public utilities. Public utilities can go into residential areas unchallenged. These are for-profit businesses, and their service is a discretionary use.
12. Keep all liability on the providers of the services. It's the only way to keep industry responsible and accountable. Do not allow liability to be shifted onto the site owners. Make the companies indemnify the towns and site owners with a blanket coverage. Make them post bonds in the event that facilities become obsolete and must be removed.
13. Keep the courts accessible to those who seek damages. It is the only recourse of fairness for consumers. Restore the ability of attorneys who are federally funded in community law offices to file class action suits on behalf of consumers. This is another right that was recently taken away without enough fanfare.
14. Tell your legislators not to consolidate so much power at the FCC. We have paradoxically given them vast new authorities, yet cut their budget. Nine FCC field offices were closed last year. They were never adept at policing the local level for RF safety. Now they've abandoned even the pretense of it, and have in fact shifted that responsibility entirely onto the states and local communities. The FCC cannot even provide a complete list of all the transmission facilities in the U.S. The Connecticut Siting Council, by the way, can't either. This whole situation has created gaps in consumer safety that are too big to bridge without regular monitoring at the local level. Also tell your legislators to pay attention to preemption moves where ever they come up.

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15. And last but most importantly, lobby your legislators for a comprehensive government research program for the radio-frequencies. The only research being done today is by industry, which some liken to the fox guarding the chicken coop.

A government RF program should include–but not be dependent upon - matching funds from industry. Such a program should be protected from the political follies of changing administrations, as well as undue influence from industry, and great care should be taken to keep it unpoliticized. It should be housed at the EPA or the National Institutes of Health, but not at the Department of Defense. Such a program should fund the appropriate research --meaning long-term, low-level, continuous exposures across a range of non-ionizing frequencies, with modulation and other common characteristics taken into consideration. And the research should have a focus on understanding the non-thermal bioeffects.

Congress called for such research over 20 years ago, but it never came to pass. It is suddenly imperative that we have the answers to the medical issues in the face of wireless America. This buildout should not be allowed to continue without that information. Only when the medical and environmental issues are better understood, will the side-issues like siting, aesthetics, economics, and property devaluation, fall into line. In the meantime, we have what we've always had - the ability to write good, strong-zoning regulations to protect our communities.

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CELL TOWERS
Wireless Convenience? or Environmental Hazard?

Proceedings of the "Cell Towers Forum"
State of the Science/State of the Law
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building far fewer towers, and taking down many of the existing ones, th solutions can only be seen as half measures.

One solution concerns lighted towers over 200 feet. Birds are at tracted to red light and by certain kinds of light pulsation. Industry is vol untarily changing to white strobe lights on towers and altering the timin patterns between strobes. And of course everyone is advocating stealt siting of antennas on/in preexisting buildings rather than the erection o new towers. But this brings up other exposure problems to the huma population, as previously discussed.

Other questions come up with this subject, too. For instance, give the magnetite in avian physiology, might the RF signals be acting as a attractant, or in some way interfering with birds' navigational abilities Several years ago, cell towers were thought to have interfered with hom ing pigeons when large numbers of them were thrown off course afte towers were erected in their fly routes.[27] A recent theory by Dr. Jonatha Hagstrum of the U.S. Geological Survey in Menlo Park, CA., howeve speculates that rather than cell towers being the culprit, low frequenc sound waves from the Concorde SST are responsible.[28]

It has been presumed that towers act as structural obstacles i birds' flyways. But birds have often been observed frantically circling tower before collision, especially towers with metal guy wire supports Sometimes birds get vertigo near towers and fly full-force into the ground Or they get tangled in guy wires. Metal is conductive and RF energy ca form "hot spots" of standing waves along guy wires. The theory that RF acts as an attractant is discounted by key ornithologists — because avia magnetite is in such small crystals that a precise resonant match with RF i unlikely, they say. But there are many different kinds of resonance tha have yet to be explored. The subject is in its infancy. That RF may b acting as an attractant still makes for an interesting area of research.

Other species, in particular frogs and salamanders, are known to b sensitive to RF, perhaps because water is a conductive medium. Repro ductive problems, deformities and death have been observed in amphibia populations.

[27] *Microwave News*, November/December, 1998.

[28] Hagstrum's paper appears in the *Journal of Experimental Biology*, vol. 203, p. 1103-111, 2000.

The Body Electric

Everything about the human anatomy is electromagnetic — we just don't think of ourselves that way. Brain waves are electrical, the heartbeat is electrical, cell division itself is electrically influenced, how neurons communicate with each other is electrical (it's called "signal transduction") and all of our hormonal and enzymatic activities are electrically regulated. In fact, one could say that not much happens in the human anatomy that isn't electrically influenced in one way or another. Even the chemical-mechanistic model of the human anatomy at its core is an electromagnetic model because all chemical reactions involve the sharing, trading, or exchange of electrons at the elemental level. And every time we move a muscle, there is that small electrical discharge, previously mentioned in the environmental section.

Researchers call this electrical cacophony "background thermal noise" and it is the basis upon which specific absorption rates are determined in standards setting.

The different ways that the anatomy uses electromagnetic energy is extremely varied and complex. The human brain, for instance, makes use of a wide range of different electromagnetic frequencies. Delta waves between 1-3 Hz are associated with deep sleep; theta waves between 4-7 Hz are associated with emotions and mood; alpha waves between 8-12 Hz signify relaxation; and beta waves between 13-22 Hz are where conscious thought occurs. It is interesting to note that most human brain activity occurs around 10-15 Hz — right where the earth's micropulsations are.

Pulsing certain frequencies can have dramatic effects on humans. For instance 10 Hz is usually relaxing, but epileptic seizures can be induced with pulsed light in that frequency when the external stimulus synchronizes with the brain's alpha waves. There are reports of seizures being induced in tower repair personnel, and in children living near cell towers. The digital PCS systems are pulsed in the ultra high frequency (UHF) ranges.

It has been known for decades that the human anatomy is actually resonant, in the strict physics sense of the term, with the FM radio bands around 87 MHz, and that human brain tissue reaches peak absorption in the UHF bands — right where telecommunications technology functions.

In laymen's terms, resonance means we act as perfect receiving antennas for a particular frequency. We are resonant with the FM bands because those wavelengths are about six feet long — the size of the

average human male. There are whole-body resonances but different body areas and organs will have different matches, too. What this means for us is that the UHF frequencies couple with brain tissue in a way that they don't with other areas of the body. It is possible, under certain circumstances, to develop standing wave phenomena — meaning that the energy doesn't rapidly dissipate, but rather forms a localized hot spot. Under some circumstances, standing waves may actually augment or become stronger than the original exposure. This is something to keep in mind with cell phones and cordless transmission products of all kinds when the antenna is next to the head.

There are also several forms of resonance. The subject is complicated and at any given time, there are numerous variables to be considered in energy research. Other species have resonant matches with certain frequencies too. We haven't even begun to explore this subject regarding the effects to other species from the massive amounts of energy we continuously infuse into the environment.

The human anatomy has also been found to react to the extremely low frequencies (ELF) around 50-60 Hz — the frequency band common to our electric utilities. Decades of research has produced data showing a generalized stress response from ELF-EMFs, suppression of melatonin and serotonin, changes in calcium ions in the cell,[29] effects on fertility in test animals, cancers of just about every type, associations with Alzheimer's disease and Amyotrophic Lateral Sclerosis (ALS) — commonly called Lou Gehrig's disease,[30] immune system suppression, autoimmune diseases and many other problems. Based on some popular press articles, people think the powerline frequencies have been found to be safe, but nothing could be farther from the truth.

Most of our RF technologies are "modulated" with ELFs, which means that a lower frequency is superimposed on a higher frequency carrier wave. Modulation is used in all telecommunications, TV, and radio transmission. If it's wireless, it's usually modulated. This means we are getting complex, multi-frequency exposures from all of our RF technologies. But the exposure standards in place throughout the world do not take modulation into consideration. Nor does most of the research that has been conducted. There is an enormous information gap in the way energy research has been done, and in the way it is therefore interpreted.

For engineering convenience, artificial categories have been created when dividing up the electromagnetic spectrum for scientific review.[31] Those setting standards for RF do not factor in any of the ELF research even though RF is modulated with the ELF bands. This means that a comprehensive scientific understanding never develops and therefore the standards for RF exposure cannot be considered reliable.

Despite what anyone says, no safe level of RF has ever been determined. What we need is a broader based examination to understand real biological effects, not just in humans but in other species as well.

Artificial Exposures

The question is, if we are as in tune with, and influenced by, the earth's natural electromagnetic background as many now think, what — if anything — are we doing to ourselves with a barrage of artificial exposures across a range of frequencies, especially in the non-ionizing bands?[32] Are we creating so much interference that we are cut adrift from our most basic moorings? And to what consequence?

Although energy is a part of the natural world, many of the artificial exposures we have created do not exist in nature. We have infused the environment with unusual waveforms such as sine and sawtooth waves, and we have created very high power intensities for some frequencies like the RF/UHF bands that are weak in their natural state. Plus, we have created propagation characteristics like digital signaling and modulation that simply do not exist in nature. These are all man-made artifacts with no clear understanding of the bioeffects, despite our ever-increasing EMF ambient background.

The buildout of the wireless infrastructure is creating a seamless blanket of microwave exposures for the first time in our evolutionary history in close proximity to the population. The use of cell phones is greatly increasing that exposure to millions of people worldwide. With wireless computer systems proposed for many schools, children — who are in a

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[29] See Carl Blackman's presentation, Chapter 2.

[30] "Stronger ALS-EMF Connection: New Link to Epilepsy Observed," *Microwave News*, September/October, 2000, p. 8-9.

[31] Blackman, *Loc.cit.*

[32] Robert O. Becker, M.D., in his seminal work *The Body Electric, Electromagnetism and The Foundation of Life*, written with Gary Selden (Quill/William Morrow, 1985) calls our electromagnetic attunement "breathing with the earth." Also see Robert Cleveland's presentation, Chapter 7, for illustrations of the electromagnetic spectrum.

higher state of cell division and who have thinner skull bones and are therefore more vulnerable — will be exposed to significant RF radiation for long periods of time. Long-term exposures are thought to be cumulative. We are, in effect, engaging in a massive biological experiment. With cell phones, one could argue that the exposures are somewhat voluntary. But with cell towers, these are involuntary exposures forced on people by the government.

Bioelectromagnetics

The area of science where this subject is most at home is called bioelectromagnetics, or biophysics. It is an arcane area that is not taught in most medical schools. Professionals wander into it from any number of other specialties like physics, biology, clinical medicine, psychology and others. There is no area of science, or medicine, or the law, or technology, or public policy or public health that is untouched by bioelectromagnetics, believe it or not. With communications and high-tech weaponry, it even intersects with national security issues.

Bioelectromagnetics is also the cutting edge for many therapeutic applications. In diagnostics, MRI scans use several non-ionizing frequencies. Genetics and cloning use low level current to jump start cell masts into life. Cancer treatments use microwaves to shrink prostate tumors. Orthopedics uses low-level electrical current to stimulate intractable bone breaks. Cardiologists use RF to stop abnormal heart rhythms: These are only a few.

The reason the non-ionizing bands are used is because they penetrate the human anatomy so deeply and are so biologically effective. It is important to keep in mind that, beyond simple thermal models of the human anatomy, no one really knows what the underlying mechanisms are that make for such effective therapies. And it is equally important to keep in mind that what has the ability to heal, also has the ability to harm.

The application of bioelectromagnetics breaks down into two camps: therapeutic uses, where the research is well funded because profits can be made there; and hazards research which is almost nonexistent in America today. Hazards research is a little like raining on someone's high-tech parade. No one in the therapeutics camp wants to think that there is more weight on the risk side than the benefits side of the risk/benefit ratio.

The hazards side is, of course, more problematic. It means we need to be a lot more judicious about the products we bring to market, and more careful with the processes by which they function.

Public Health Issue

Most public health officials and doctors are unaware of the body of research — both pro and con — that bioelectromagnetics encompasses, despite the fact that the primary issues on the table concerning ambient exposures are about the public health.

Urban "electrosmog" has increased dramatically over what it was twenty years ago. In 1978, after surveying twelve large American cities, the U.S. Environmental Protection Agency (EPA) issued a report on background radiation levels.[33] Median exposure of the population was very low at 0.005 microwatts per centimeter squared ($\mu W/cm^2$), with the major contributor being from FM radio. This was long before the advent of cellular technologies and a host of other RF-generating services like pagers, palm pilots, and the like.

No U.S. follow-up has been done since the late 1970's, but in 2000, a survey was conducted in Sweden by Dr. Yngve Hammerius of Chalmers University of Technology in Gotebörg. Dr. Hammerius found radiation levels to be ten times higher than they were just two decades ago in that country. In the cities monitored, the median power density was 0.05 $\mu W/cm^2$, with 61% coming from cell tower base stations.[34]

Ambient increases in American urban areas are thought to be comparable or even higher, given the larger number of wireless service providers licensed by the FCC. It is time we pressured Congress to refund the EPA's research program, pressured the EPA to follow-up on the 1978 background RF levels, and in general took a far more cautious approach to this subject.

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[33] *Radiofrequency Radiation Levels And Population Exposure in Urban Areas of the Eastern United States*, United States Environmental Protection Agency, Office of Radiation Programs, EPA-520/2-77-008, May 1978.

[34] "Urban Electrosmog Increasing," *Microwave News*, July/August, 2000, p.3.

Disconnect in the Sciences

One of the reasons we are in the situation of a burgeoning technology overtaking our understanding of the health consequences is because there is a major disconnect in the sciences with a stake in this subject. Whole branches of science can be completely out of touch with each other.

Bioelectromagnetics is the crash point between the living sciences like biology, and the non-living sciences like physics and engineering. Biologists rarely know anything about physics, and physicists rarely know anything about biology. But bioelectromagnetics is an integrative specialty where the two converge and it is one of the most contentious areas of science today. A certain amount of territoriality and professional bias comes into play in bioelectromagnetics circles.

Unfortunately, the non-living sciences have historically dominated the field of bioelectromagnetics, determining everything from how the intellectual debate is framed, who participates, what research is funded, and how — ultimately — the safety standards are set. This has created an inherent bias towards the needs/perspective of the physics community, which is concerned with how to make the technology work, when in fact the issues are biological in nature, meaning, what are the consequences of the technology? The physicists and biologists are often at each other's throats in the bioelectromagnetics community because of it.

The short course on the argument is that physicists and engineers — who create the technology — shouldn't be controlling anything when it comes to biological effects research. Scientists from the non-living branches shouldn't be making determinations on public health. That is the jurisdiction of our public health officials, clinicians and others from the biology branches of science.

On the subcommittee of the American National Standards Institute[35] that sets standards for frequencies used in telecommunications, there

[35] The American National Standards Institute (ANSI) is an organization comprised mainly of industries that set voluntary national standards for numerous industrial applications and processes. The industry subcommittee for radiofrequency radiation is the Institute of Electrical and Electronics Engineers (IEEE). The subcommittee title is C-95.1 for the microwave bands. The standards they recommend are titled ANSI/IEEE C.95.1. The last year of the revision is then added, i.e. ANSI/IEEE C.95.1-1992. Until 1996, the FCC had traditionally adopted the ANSI/IEEE recommendations. But in 1996, the EPA, which has final jurisdiction over ambient exposures but has failed to produce their own

are only about five M.D.s out of a review panel that numbers in the hundreds. Many committee members are military or industry researchers. Conflicts of interest abound. The standards are often determined less with biology in mind than with engineering requirements to make the systems work.[36]

But the problems on the table are not about physics and engineering. As a society, we already know what those branches can create through their incredible talent. Now we are concerned with biological questions, such as: What are the consequences to the living systems in the path of these technologies? Are some people more sensitive than others? Is it safe to allow ambient levels of RF to proliferate as long as they stay within a certain threshold? Do we know what that threshold is? Are the data reliable? If not, what data do we need? And should we be more cautious until we get it?

Heart of the Controversy: Thermal v. Non-Thermal Effects, The FCC Standards

The heart of the scientific controversy revolves around what are called thermal-effects — meaning certain frequencies' ability to heat tissue like what occurs in a microwave oven — versus non-thermal effects, meaning anything that occurs below that heating threshold.

No one disputes that there are biological effects from non-ionizing radiation in the radiofrequencies. The only issue is whether there are hazardous effects below heating. If so, what are they? And are they reversible? No one disputes the accuracy of the heating model. It is well established, and in fact is used as the jumping-off point for other biological understandings.

The non-thermal effects work, however, is far more interesting. It means that we don't understand something fundamental about the human anatomy, all the while we are increasing our exposures. Industry and the military like to pretend that this entire body of work either doesn't exist, or

standards, insisted that the FCC adopt the National Council On Radiation Protection and Measurements (NCRP) standards which were five times more stringent than IEEE's. In response, the FCC – after considerable pressure from the industry and the U.S. military, created a two-tier exposure limit. IEEE is used for "controlled" environments where professionals would be allowed higher exposures; and the NCRP standard was adopted for "uncontrolled" environments where civilians would likely be exposed.

[36] See Carl Blackman's presentation, Chapter 2.

is suspect. But non-thermal effects are established now too.[37] Only the old guard from the 1950's cold-war era in the military, and the industry, continue to try to hold the line on the non-existence of non-thermal effects. Their purpose is to make sure that nothing changes regarding public policy. It is to industry's advantage to keep saying, "nothing is proven" and have people believe it.[38]

But that is not true and hasn't been for a long time. Immune system suppression, increases in the permeability of the blood brain barrier, changes in calcium ions, DNA damage, and numerous cancers are well established in the scientific literature, among many other things. The problem is, no one knows quite how to interpret the data or what to do about it because the implications are enormous to modern life. Merely turning down the power intensities of RF generation may not be adequate.

The FCC standards currently in place are based on the thermal model of the human anatomy with safety factors built in. But is that enough? The last time the standards were revised by the IEEE C-95.1 committee was in 1991 and approved by ANSI in 1992.[39] The committee reviewed no studies past 1985. In 1996, the FCC adopted a combination of this standard, and the slightly more restrictive standard that was put out by the National Council of Radiation Protection and Measurements (NCRP) in 1986. This means that by the time the FCC created the standards currently in place, no new studies had been reviewed or included in the database for eleven years!

Since 1985, hundreds of new studies have been published — approximately 80% of which have found biological effects, some at very low power intensities comparable to cell tower exposures.[40] But none of these

[37] The U.S. military's traditional position has been that non-thermal effects do not exist. The U.S. Air Force Office of Scientific Research, and the research labs at Brooks Air Force Base in Texas, are the lead military agencies for non-ionizing biological research today. They help create non-lethal weapons using non-ionizing radiation, conduct research, and co-sponsor symposiums on therapeutic applications, among other things. There are contradictions in their position, however, as can be demonstrated in the co-sponsorship of two electromedicine conferences in 2000 and 2001 entitled "Nonthermal Medical/Biological Treatments Using Electromagnetic Fields and Ionized Gases."

[38] See Andrew Marino's presentation for a full discussion of standards of proof and how determinations are made.

[39] *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*, IEEE C.95.1-1991.

[40] See Henry Lai's presentation, Chapter 3, and Appendix B for a list of recent research abstracts provided by Dr. Lai.

studies are factored into the U.S. standards, which continue to be among the most lenient in the world. Other countries, however, are using the recent literature to adopt far more stringent standards, as well as recommending prudent avoidance when siting cell masts near the population.[41]

When telecommunications companies point out that they are in compliance with the FCC regulations and in some instances are well below the standard, it is supposed to make people feel more comfortable about the technology. But the standards that are in place are completely inadequate, given the new research, as well as a more complex understanding of how biological systems function. No one should be lulled into complacency with this argument.

Industry representatives who present information at the local level often blur important distinctions. They liken the antenna technology to baby monitors and to 25 and 100-watt light bulbs, in an attempt to assuage fears with common analogies for products we have long accepted. What they leave out is that the technology uses 100 watts of radiated power per channel, and there can be dozens of channels on one antenna, and dozens of antennas on one installation. Understood this way, telecom facilities are not so low-powered after all but are rather like having an AM radio station transmitter in the neighborhood. And since most towns try to co-locate many providers together — which they should — areas around towers can quickly become very complex electromagnetic environments that are difficult to assess and monitor.

Non-Linear Effects

One of the most fascinating, and baffling, observations across a breadth of energy research at different frequencies is something called non-linear effects.[42] In energy research, it is often observed that the most profound effects are observed at the lowest intensities, or that "windows" exist for some effects at low exposures but not for others at higher exposures.

This is the exact opposite of our standard toxins model where the highest exposures create the most dramatic effects. In a toxins model, adverse effects are determined at specific exposures and regulations are then

[41] For a discussion of "prudent avoidance" and the "precautionary principles" adopted by other countries, see Carl Blackman's presentation, Chapter 2.

[42] See Carl Blackman's presentation, Chapter 2, and Andrew Marino's presentation, Chapter 5, for more discussion of non-linear effects.

set where effects are no longer observed. Virtually all of our regulatory apparatus is built on this traditional model.

But non-linear effects stands the toxins model on its head. Again, it means we do not understand something fundamental about living biological systems, all the while we are increasing our energy exposures. Energy research is very different than toxins research. We are clearly dealing with a whole new model. With non-linear effects, some exposures may prove unsafe at any intensity. There is already some indication of this in some of the research. And if this is true for us, it is certainly true for other species.

Flaws in the Research

There is a serious design flaw in much of the research that has been used to reach conclusions about RF safety. Historically, because of economic constraints — and because scientists are impatient human beings like the rest of us — energy research has been designed with high-power exposures for short periods of time. Damage has been calculated, then downward extrapolations have been made to presumed safe levels. This has been effective for the thermal model of the human anatomy because heating effects can be readily observed. But with non-thermal effects, that approach is pure speculation, especially when non-linear effects are considered.

For the standard toxins model, the high-exposure-downward-extrapolation is the normal route. But in real life, energy exposures are not like that. Real life consists of long-term, low-level chronic exposures such as would be experienced by those living near telecommunications installations — and that kind of research, unfortunately, is sparse. In fact, there was only one major long-term, low-level study conducted back in the early 1980's and it found increases in cancer in test animals.[43] In the 1990's, a

[43] In the early 1980's, the U.S. Air Force commissioned a $5 million study into the biological effects of long-term, low-level exposures in test animals at the University of Washington's Bioelectromagnetics research lab, the oldest in the country. Nearly the entire first group of test animals died of an unidentified infection. Dr. Robert O. Becker, author of *The Body Electric* and *Cross Currents*... observed at the time that this was likely due to immune system suppression which made the test animals more susceptible – an observation that he and colleagues had made in research of their own. The tests had to begin again. Several generations of rats were exposed to pulsed microwaves in ranges that simulated the levels allowed by current standards for humans. Results found increases in adrenal medulla tumors, malignant endocrine and ectrocrine tumors, and increases in carcinomas and sarcomas. The authors of the study tried to downplay their own findings and the study became controversial. (*Effects of Long-Term Low-Level Exposure on Rats*, by A.W. Guy *et al.*, University of Washington, Vol. 9, USAFSAM_TR-85, Aug. 1985.)

handful of studies of multi-generational, low-level exposure studies of test animals also found adverse effects.[44] [45]

Beyond these few studies, most energy research is of an inappropriate kind and it is being used to reach inappropriate conclusions about safety.

Research Manipulation

There is currently no unbiased, federal research program into this subject. The lead agencies have all been defunded. Industry completely controls the show and there are a number of ways to manipulate the research without actually tampering with the data itself.

One way is to make sure that the right research is never funded — to keep looking at, for instance, thermal effects rather than non-thermal effects; or to keep designing tests with high-power, short-term exposure parameters. Another way is to set up the research protocols so that no effects are likely to be found, such as setting the power densities at vanishingly small intensities. Or to not replicate studies that have found effects — that way industry can say "that study was not replicated," implying that someone tried and failed thereby casting doubt on the integrity of the original work, when in fact no attempt was made at all.

When major organizations like the National Research Council are asked to conduct meta studies to see if patterns are emerging in certain areas of the science, they often restrict their analysis to studies that have

[44] In 1997, investigators in Greece exposed five generations of mice to RF in several places near an antenna farm. RF power densities were between 168 nW/cm^2 and 1053 nW/cm2. A progressive decline in fertility was observed which ended in irreversible infertility by the fifth generation. Prenatal development of newborns was altered. ("RF Radiation – Induced Changes in the Prenatal Development of Mice," by Ioannis N. Magras and Thomas D. Xenos, *Bioelectromagnetics* 18:455-461 1997.)

[45] Also in 1997, investigators in Australia exposed mice prone to develop lymphoma to pulsed 900 MHz EMFs at low intensities. After 18 months, lymphoma risk was found to be statistically higher in exposed animals. The significance of this study is that alterations were found in immune system B-cells. Changes in B-cells are implicated in 80-90% of all cancers. This formed a plausible theory about why so many different kinds of cancers have been observed with EMF exposures. ("Lymphomas in Eu-Pim1 Transgenic Mice Exposed to Pulsed 900 MHz Electromagnetic Fields," by Michael Repacholi *et al.*, *Radiation Research*, 147: 631-640, 1997.)

been peer reviewed and replicated. If replication has been blocked, such studies never make it into the overall research picture — which can then be skewed in favor of industry findings.

Sometimes studies are repeated by other researchers using different test parameters. When the same results aren't reached, it is said that the original study "wasn't replicated" which in the literal sense, it wasn't. The design was altered. But the phrase is again used to discredit the original work.

All of this would imply some massive collusion on the part of individual researchers to hoodwink the public, but that's not the case. Most researchers embody the utmost personal and professional integrity. The problem is that industry — and only industry — is footing the bill.

Some of the things the telecom industry routinely does cannot be considered in the best interest of the public. For instance, in their contracts, industry requires independent researchers to sign confidentiality clauses, agreeing not to speak about their work until it is published. There can be up to three-year lag times between when the research is done and professional publication. And sometimes the research just never sees the light of day — if it goes against industry desires.

Contrast that to the pharmaceutical industry where researchers have to pick up the phone and immediately call the FDA if adverse effects are found in test animals or in clinical trials with drugs. The telecommunications industry also gets final edit before research findings are made public. No other industry exercises this loophole and expects to get away with it. Some independent researchers have stated that they have been asked to change their interpretations of their work to suit industry spin. The problem is endemic to telecom research. This situation is clearly deplorable for all concerned. Independent, unbiased research must be funded as soon as possible.

The Bottom Line

The bottom line is this: our current presumptions about RF safety may be totally unreliable. Inappropriate research has been used to reach inappropriate conclusions. Inappropriate professions — physicists and engineers — are controlling the situation and making decisions for the public health that is far outside of their professional expertise. And our government regulatory agencies have been defunded to the point of inefficacy, as

well as co-opted from the inside by the very industries they are supposed to regulate.

This shifts the burden onto citizens to make the decisions, and to insist that some clarity be brought to this issue. We are the ones taking the risks.

Case Law

Telecommunications law used to be confined to a few law firms in the Washington, D.C. area where a handful of attorneys helped various industry clients navigate the labyrinths of government and FCC regulation. Today, most municipal land-use attorneys have a passing knowledge of how telecommunications law intersects with planning and zoning issues, with varying degrees of legal accuracy and insight. The Telecom Act created a whole new area of case law and has spawned concentrations in legal expertise that did not exist at the local level prior to 1996. It is still very much of an evolving area of the law.

When the telecom buildout first started in earnest after 1996, the industry seemed to think they had all the power and legal right to swagger through communities, intimidating towns into giving them pretty much what they wanted. But gradually, towns stood up for themselves. Case law that protects the communities has more and more come into being as various suits, covering different issues, made their way through the courts and the appeals process.[46] One of the interesting things to ponder about this subject is the fact that Congress, in enacting Section 704, shifted the burden of ironing out the details onto the judiciary branches of government. That's what happens when ideology reigns over intelligent governance.

At the time of the BLEC Cell Towers Conference in December of 2000, a major legal effort had been launched at the U.S. Supreme Court to reverse Section 704 on constitutional grounds. A Petition for Writ of Certiorari had been filed by Whitney North Seymour, Jr., Esq., of Landy & Seymour in New York City in the Fall of 2000.[47] By December 2000, the Supreme Court had neither accepted nor rejected the petition for review. Since that time, the petition has been declined, leaving a lower court ruling in place.[48]

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[46] For a full discussion of pertinent case law, see James Hobson's presentation, Chapter 9.

[47] See Appendix A for the full brief.

[48] The original suit was filed in the United States Court of Appeals for the Second Circuit in New York City. Petitioners were the Cellular Phone Task Force, the Ad-Hoc

Only one out of every 100 cases submitted to the Supreme Court are accepted. However, since the case was not tried on its merits, the legal points are still cogent and waiting to be heard in the proper venue, at another time.

Seymour's brief argues that although the federal government has the power to set health standards in areas relating to interstate commerce, that where it has defaulted on its obligations to protect public health, the federal government may not simultaneously prevent the states from taking action to do so. It further argues that with the FCC and the EPA hobbled by Congress in their respective regulatory roles, the power and responsibility to protect the public health reverts to the people of the states as part of their inviolable sovereignty. The legal arguments are a classic federal v. states rights case. Many other important points were also made in the brief, which go directly to the heart of the problem.

Numerous municipalities across the country, as well as several congressional offices filed amicus briefs in support of the petition, but the Supreme Court declined to hear the case. It was a big disappointment to

Association of Parties Concerned About The Federal Communications Commission Radio Frequency Health and Safety Rules, and the Communications Workers of America, AFL-CIO, CLC, *et al*. These had been three separate, but related suits that were combined for review by the Second Circuit. Each petitioner came at the subject from a different angle. The Cellular Phone Task Force, headed by Arthur Firstenberg and represented by attorneys John Schulz of Colorado and Edward Collins of Massachusetts, argued that the FCC was in violation of the Americans With Disabilities Act in not taking those with electrical sensitivities into consideration with RF exposures, among other points. The Ad-Hoc Association of Parties Concerned... headed by Libby Kelly of California (a former consultant in the U.S. Department of Health and Human Services and now President of the California Council On Wireless Technology Impacts in Novato, CA.), and David Fichtenberg, a public health statistician in Olympia, Washington, represented by James Hobson, Esq. of Washington, D.C., argued that the FCC was not enforcing its own National Environmental Protection Act (NEPA) regulations which it is required to do by law, among many other points. And the Communication Workers of America, represented by Howard Symons, Esq. of Washington, D.C., argued that in setting a two-tiered exposure standard, that communication workers were being discriminated against because they were subjected to higher exposures than non-professionals. Intervenors included most of the telecommunications and broadcast industries and adjunct others. There were hundreds of amicus briefs filed in support of the various petitions. The briefs and supporting materials were voluminous and the case complex. It is difficult to sue a federal agency but there was a narrow window of opportunity after the FCC adopted new regulations in 1996. The Second Circuit courtroom was packed during oral arguments. The ruling, which was finally handed down in April of 1999, went against all petitioners and in favor of the FCC.

the many people who had hoped for relief from the highest court. (In declining to hear the case, the Supreme Court essentially bounced the solution to the problem back onto the legislative branch that created it in the first place.) Three other Petitions for Certiorari were also filed at that time over other legal points originating from the Second Circuit case. All were declined.

There is now conflicting case law at the appellate level in the U.S. Fourth Circuit Court of Appeals concerning constitutional questions about the Telecom Act that have yet to be resolved. The Fourth Circuit is considered among the most conservative in the country and is often the last step before cases go to the Supreme Court. The issues raised in the Seymour brief are not over by any means. They are just waiting for another spoke of the wheel to ride.

Liability

Liability issues can be significant for municipalities and individual site owners alike. Keep in mind that the industry has been successfully shifting liability away from itself and onto others in numerous ways — including rigged science, controlling the standards-setting committees, buying influence at the political level, co-opting key regulatory agencies, and getting industry-friendly riders through the E-911 bill, to name a few.

Unbeknownst to most people at the local level, this liability has been shifted downward to those making land-use decisions. The federal preemptions against taking the environmental effects of RF into consideration do not necessarily protect local officials who can still be named individually in lawsuits for poor siting decisions. Despite the preemptions, it is still their legal obligation to do everything possible to protect the health, safety, and welfare of the community and its citizens.

The same is true of churches and private landowners that lease space to telecom providers. There is no statute of limitations on health claims for EMF damage. Everyone with a stake in siting decisions can be sued if adverse health effects turn up. With more and more science circling around the problem and coming up with significant data, such siting decisions near populated areas are lawsuits-waiting-to-happen.

Municipalities are increasingly seeing applications from independent tower companies like SBA and American Tower Corporation. These are not service providers but rather companies looking to establish towers wherever they can in order to lease space to RF industries. Towns can

legally disallow towers built on speculation. The Telecom Act only preempts for providers of the service, not independent speculators.

Such independent tower companies are invariably set up as limited liability corporations (LLC). High-risk businesses always do this. SBA at least acknowledges in its investment portfolios that RF may turn out to be a risk for investors in company stock. American Tower Corporation has been fined $212,000 by the FCC for antenna structure violations at various sites around the country. The fines relate to 36 separate violations that include failure to notify the FCC of ownership changes; failure to register towers with the FCC, and failure to properly light towers during construction, among other problems.

With a limited liability company, most of the financial assets are in other holding companies and are therefore out of reach. If a town, or individual gets into trouble with a LLC, they may end up owning a tower, but not much else. Many service providers are selling their own towers to such companies. It is yet another way of shifting the liability away from themselves. No one wants to be responsible for damage at the local level for property devaluation and for health claims. That puts the liability squarely on individual planners and zoners, as well as the landowners where installations are sited, if citizens need legal redress.

A Note About The Precautionary Principle and Prudent Avoidance

Several European countries, having taken a look at the recent data, are taking a different approach to the RF question. They are recommending prudent avoidance when siting antenna installations near schools, residences, hospitals or wherever people congregate. For cell phone use, they are recommending that children below the age of 16 be advised not to use cell phones for anything other than emergencies.[49]

This approach is part of what is referred to as the Precautionary Principle, which has been adopted by many countries, including the U.S.

[49] Thus far, groups making this recommendation include: the Independent Expert Group On Mobile Phones and Health – commonly called "The Stewart Report" in the UK, The Greater Glasgow Board of Health in Scotland, The German Pediatric Society, The Ecolog Institute in Hanover Germany, The European Parliament Directorate General for Research, the Italian government, and The Royal Society of Canada. Other countries have instituted far more stringent RF regulations than the U.S. See Sage Associates chart, Carl Blackman's presentation, Chapter 2.

for various applications in international treaties. It is not a radical or new way of going about situations that deal with environmental uncertainty.

The Precautionary Principle holds that when questions of safety are concerned, precautions should be taken to protect the public health even if scientific data is incomplete, or mechanisms of action are not understood. It is the only approach that makes sense given what we already know about RF, and given the situation in America with industry influence at all levels. Prudent avoidance should be the driving motivation for towns siting antenna installations near the population.

What Towns Can Do: Planning and Zoning Regulations

Something municipalities fail to keep in mind is the basic legal fact that it is up to the providers of a service or product to prove that their wares are safe. It is not up to us to prove that they are unsafe. The telecommunications industry has largely failed to do that. Just because they are within the FCC guidelines for RF emissions, does not prove safety.[50]

No town today should allow itself to be intimidated by telecom service providers or adjunct industries like tower companies. Despite the preemptions, there is still a lot of power reserved to the municipalities, and there is a growing volume of good case law to back up local decisions. But those in decision-making positions need to understand that this form of land use regulation is very different than traditional forms. Telecom regulation needs to be understood from a completely different vantage point. This is NOT just an aesthetic issue. It is a medical one.

Good zoning regulations are still the best protection but this kind of regulation can be complicated.[51] Here are some key provisions that should be included:

- Monitoring for RF emissions is essential, both before an installation goes on line, and afterward. It is the only way to determine what was changed in the environment, and to document the date of that change. Pre- and post testing will give a community a baseline of data in case problems turn up later. It will also assist with liability issues because it will demonstrate that the town was truly paying attention. Regular, annual monitoring should be instituted by

[50] See Andrew Marino's presentation for a fuller discussion of this point, Chapter 5.

[51] See Anthony Blair's presentation, Chapter 13, for sample regulations from Great Barrington, Mass. – the first community to write this kind of land-use by-law

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independent RF engineers — not industry engineers. This becomes particularly important as other RF industries co-locate on the same installation. The industries should pay for the monitoring, not the taxpayers. Monitoring protocols should be consistent from year to year, using the same equipment, etc.[52]

- Large setbacks should be established from homes, schools, hospitals, or wherever people congregate — at least 1500 feet. But individual topography counts a great deal.[53] In some circumstances, 1500 feet may not be enough if dwellings on nearby hillsides are on a lateral plane with antennas. Also other RF sources need to be factored in. Sometimes different frequencies can couple with each other in ways that engineering computer models cannot predict, creating significant exposures in unexpected places.
- Take metal objects into consideration because they are conductive materials that can create localized hot spots. Things to avoid siting antennas on, or near, include: metal water tanks, roofs, architectural girders, elevator cables, etc.
- Establish by-right zones where facilities can locate — but nowhere else.
- Discourage private entrepreneurs and churches from establishing sites. Such people and organizations rarely understand the complexities of the issue or what they are getting into.
- Only allow signal strengths that will provide for adequate coverage and adequate capacity, not blanket coverage. The right to determine signal strength at the local level has been upheld in federal case law in U.S. Sprint v. Willoth, and by the FCC. The FCC only requires approximately 75% coverage of an area — not 100% coverage. It has been understood from the beginning that there would be holes in coverage, especially in hilly topography. If towns have environmentally sensitive areas or historic landmarks to protect, they should acknowledge such sites in their master plans of development as off limits to this technology.
- Towns should require extensive engineering detail in their applications, otherwise companies do not have to prove that a facility is

[52] See Appendix D, Cabot, Vermont for a monitoring protocol.

[53] See William Curry's presentation, Chapter 6, for a full discussion of how topography can affect RF exposures at specific locations.

really needed. They may be speculating on a site without admitting it.

- Require independent engineering review of all applications and modifications to existing sites. Often applicants are sloppy and rote in their preparations, using cookie-cutter computer models from site-to-site. In requiring such detail, towns are establishing the facts of a case that may be needed after turning an installation down. Engineering detail is critical.[54]
- Encourage those who want cell service to switch to satellite-based systems such as Globalstar and Teledesic, which will reduce the number of ground-based facilities.
- Require the service provider, the tower owner, and the landowner, to all be part of the application. That will discourage towers being built on speculation.
- Write airtight liability protection into the regulations by all concerned, with proof of insurance annually submitted. This should transfer to any new owners of the facilities or properties. Failure to substantiate proof of liability protection should constitute a revocation of any permit.
- There are many other constructive things that towns can do . . .

Most importantly, contact your legislators and insist that they fund the appropriate, unbiased, government research into the long-term, low-level biological effects of RF radiation. That is the only way we will know what the risks actually are. Until then, it is a great global experiment, without the courtesy of citizens being asked to sign consent forms for their participation. It is equally important to refund the other agencies with a stake in this issue — the EPA, the FDA, and the FCC. Budget slashing zeal has gone too far. The agencies can no longer do their respective jobs. We are the ones paying the price in uncertain risks, and sleepless nights when our children are affected.

There are ways to remedy these problems. But as a society, we must put our shoulder to the task. It is still fundamentally up to us to enact good laws, make our wishes known to our legislators, and hold them accountable. It is also up to us to insist that industries be more responsible

[54] See Cabot, VT. regulations in Appendix D for engineering details contained in zoning regulations. These were also discussed in Mark Hutchin's presentation, Chapter 12, and in Tony Blair's presentation, Chapter 13.